

حمل الآن

مجانا وحصريا

امتحانات رقم (1)

الترم الثاني



Final Assessment from the School Book



First Group :

► Choose the correct answer from the given ones :

- 1 If x , 5, 12, and 30 are proportional, what is the value of x ?
(a) 2 (b) 3 (c) 4 (d) 16
- 2 What is the solution set of the inequality $-x > 4$ in $\mathbb{R}$?
(a) $]-\infty, -4[$ (b) $]-\infty, 4[$ (c) $]-4, \infty[$ (d) $]4, \infty[$
- 3 If $f(x) = x + 3$, $g(x) = x^2$ so what is the value of $2f(3) + 3g(2)$?
(a) 12 (b) 18 (c) 24 (d) 36
4. If the probability of a team winning any match is 80%, how many matches is the team expected to win out of a total of 35 matches ?
(a) 7 (b) 14 (c) 21 (d) 28
- 5 The circumference of the base of a right circular cylinder is 16π cm and its height is 2 cm. What is the volume ?
(a) $16\pi \text{ cm}^3$ (b) $32\pi \text{ cm}^3$ (c) $64\pi \text{ cm}^3$ (d) $128\pi \text{ cm}^3$
- 6 What is the slope of the straight line passing through the two points (2, 7), (-4, 8) ?
(a) $-\frac{1}{2}$ (b) $-\frac{1}{6}$ (c) $-\frac{2}{3}$ (d) -6
- 7 What is the distance between the two points (4, 7), (1, 11) ?
(a) 5 length units. (b) 6 length units.
(c) 7 length units. (d) 8 length units.
- 8 The diameter length of a circle is 12 cm. What is the circumference of this circle ?
(a) 6π cm (b) 12π cm (c) 18π cm (d) 24π cm
- 9 The base of a right prism is in the shape of a square with side length 5 cm, and its height is 6 cm, what is its lateral area ?
(a) 30 cm^2 (b) 120 cm^2 (c) 150 cm^2 (d) 170 cm^2

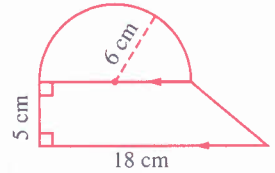
Second Group :

► Answer the following questions :

1 If b is a mean proportional between a, c , prove that: $\frac{a-b}{b-c} = \frac{a+3b}{3c+b}$

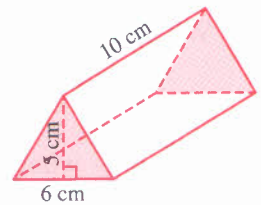
2 Represent graphically the function f where $f(x) = 4 - 2x$

3 Find the area of the figure.
knowing that : $(\pi \approx \frac{22}{7})$



4 In the given figure :

Find the volume of the prism



5 If R is a relation from X to Y where $X = \{2, 3, 5\}$, $Y = \{5, 7, 8\}$ and " xRy " means " $x + y = 10$ " for every $x \in X, y \in Y$. Write R as a set of ordered pairs, and represent it using an arrow diagram and a graph. Does the relation represent a function or not? why?

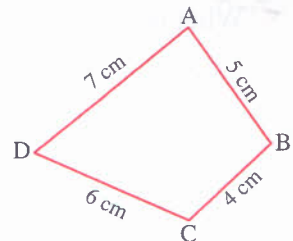
6 In the given figure :

$ABCD$ is a quadrilateral in which

$BA = 5 \text{ cm}$, $BC = 4 \text{ cm}$

, $CD = 6 \text{ cm}$, $DA = 7 \text{ cm}$

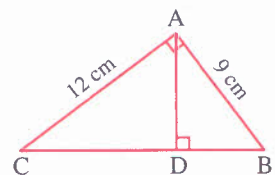
Prove that : $m(\angle ABC) > m(\angle ADC)$



7 In the given figure :

If $\overline{AB} \perp \overline{AC}$, $\overline{AD} \perp \overline{BC}$

Find the length of each of : $\overline{AD}$, $\overline{CD}$



Final Exam Models



Exam

1

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 What is the solution set of the inequality : $3x + 7 \leq 10$ in $\mathbb{R}$?

- (a) $[1, \infty[$ (b) $]0, \infty[$ (c) $] - \infty, 1]$ (d) $] - \infty, 0[$

2 If $\frac{x}{4} = \frac{y}{6}$ what is the value of : $\frac{x}{y}$?

- (a) $\frac{2}{3}$ (b) $\frac{3}{2}$ (c) $\frac{2}{5}$ (d) $\frac{3}{5}$

3 If the probability of a team winning in a football match is 0.75 , then how many matches are expected to be won out of a total of 24 matches ?

- (a) 6 (b) 12 (c) 18 (d) 20

4 What is the slope of the line passing through the points A (5 , 4) and B (− 2 , − 3) ?

- (a) $\frac{4}{5}$ (b) $\frac{1}{3}$ (c) 1 (d) − 1

5 If $(x, 5) = (3, y + 1)$ what is the value of : xy ?

- (a) 7 (b) 10 (c) 12 (d) 15

6 If A (2 , 5) , B (− 4 , − 3) What is the length of $\overline{AB}$?

- (a) 5 (b) 7.5 (c) 10 (d) 12.5

7 What is the third proportional to the two numbers $x^3, 2x^2$?

- (a) $2x$ (b) $4x$ (c) x^2 (d) $2x^5$

8 The domain of the relation $R = \{(1, 2), (1, 3), (4, 2), (4, 3)\}$ is

- (a) $\{3, 2\}$ (b) $\{1, 4\}$
(c) $\{1, 2, 3, 4\}$ (d) $\{3, 4\}$

9 What is the circumference of the circle whose diameter length is 12 cm ?

- (a) 3π cm. (b) 6π cm. (c) 12π cm. (d) 36π cm.

Second Group :

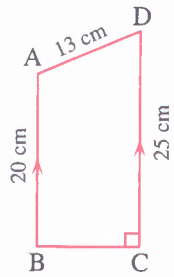
► Answer the following questions :

1 If $x, 6, 12, y$ in a continued proportion Find the value of each of : x, y

2 In the given figure :

ABCD is a right trapezoid

What is the length of the projection of $\overline{AD}$ on $\overrightarrow{BC}$?

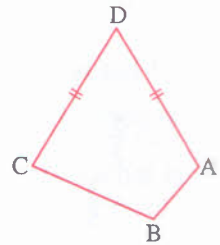


3 In the given figure :

If : $DA = DC$,

$m(\angle BAD) > m(\angle BCD)$

Prove that : $BC > AB$



4 If : a, b, c, d are proportional quantities Prove that : $\frac{a+b}{c+d} = \frac{b}{d}$

5 Represent graphically the function f where : $f(x) = 2 + x$

6 In the given figure :

Find the volume of the prism



7 One of the car factories produces 3 models of cars in a year and its count is 500 cars of the first model , 700 of the second model , 300 of the third model , if the factory management wants to take a sample size of 105 cars from its total production represented in each model according to its production size , find the number of units of each model in the sample.

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 If : $\frac{a}{b} = \frac{2}{7}$ what is the value of : $\frac{2b}{7a}$?

(a) $\frac{4}{49}$

(b) $\frac{2}{7}$

(c) 1

(d) $\frac{49}{4}$

2 If : $f(x) = 5$, then : $3f(-5) = \dots\dots\dots$

(a) -2

(b) 15

(c) -15

(d) -25

3 In the given figure :

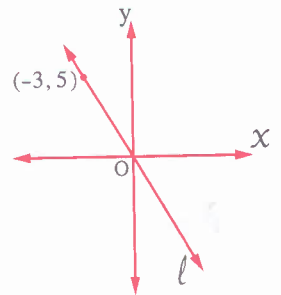
What is the slope of the line ℓ ?

(a) $\frac{5}{3}$

(b) $\frac{3}{5}$

(c) $-\frac{3}{5}$

(d) $-\frac{5}{3}$



4 In the given figure :

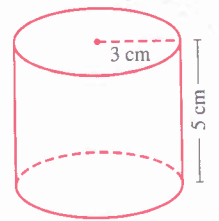
What is the surface area of the cylinder ? ($\pi \approx 3.14$)

(a) 70.65 cm^2

(b) 141.3 cm^2

(c) 150.72 cm^2

(d) 301.44 cm^2



5 If : b is a mean proportional between 3 , 12 what is the value of b ?

(a) ± 4

(b) ± 6

(c) ± 9

(d) ± 36

6 What is the solution set of the inequality : $2x - 1 < 9$ in $\mathbb{R}$?

(a) $]-\infty, 5[$

(b) $]-\infty, 5]$

(c) $[5, \infty[$

(d) $]5, \infty[$

7 If : $X = \{2, 3\}$, $n(X \times Y) = 6$, then : $n(Y^2) = \dots\dots\dots$

(a) 3

(b) 4

(c) 9

(d) 16

8 What is the distance of point A (-3 , 4) from the origin ?

(a) 3 units of length.

(b) 4 units of length.

(c) 5 units of length.

(d) 7 units of length.

- 9 If the school's media team consists of 18 members , 4 of them are teachers and 8 are students and one member of the team is randomly selected to give a speech , what is the probability that the selected member is a student or a teacher ?

(a) $\frac{2}{9}$

(b) $\frac{1}{3}$

(c) $\frac{4}{9}$

(d) $\frac{2}{3}$

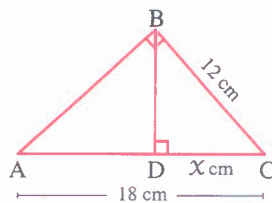
Second Group :

► Answer the following questions :

- 1 If b is the mean proportional between a and c , prove that : $\frac{a-c}{a+b} = \frac{a-2b+c}{a-b}$

- 2 In the figure opposite :

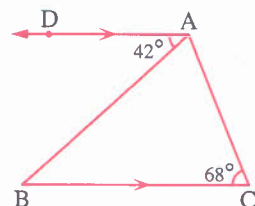
Find : the value of X ?



- 3 The base of a triangular prism is a right triangle , with a hypotenuse length of 17 meters and one of its sides is of length 8 meters. If the height of the prism is 12 meters , what is its volume ?
- 4 If R is a relation from X to Y where $X = \{2, 3, 4, 5\}$ and $Y = \{3, 5, 6, 7, 9, 11\}$ and « $X R y$ » means « $y = 2X + 1$ » for every $x \in X, y \in Y$, write R as a set of ordered pairs and represent the relation with an arrow diagram , and state whether the relation represents a function or not.
- 5 Find the value of X that makes 4 , 5 , X , 10 are proportional.

- 6 In the given figure :

Prove that : $BC > AC$



- 7 A classroom has 36 students , of whom 27 students passed in mathematics , 12 students passed in Arabic and 9 students passed in both exams. If a student is chosen randomly. Find the probability that the selected student passed in mathematics only. If the total number of students in the school is 540 , what is the expected number of students who will pass in mathematics only ?

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 If : $\frac{a}{b} = \frac{b}{c} = 3$, which of the following is correct ?

- (a) $a = 3c$ (b) $a = 9b$ (c) $a = 9c$ (d) $a = 6c$

2 If : $(X^3, y + 1) = (27, \sqrt[3]{27})$, what is the value of $X + y$?

- (a) 5 (b) 4 (c) 3 (d) 2

3 What is the slope of the line passing through the points A (3 , 2) and B (4 , 2) ?

- (a) 2 (b) 1 (c) 0 (d) is undefined.

4 If : $R = \{(2, 5), (3, 6)\}$ is a function , then the range =

- (a) $\{2, 5\}$ (b) $\{3, 6\}$ (c) $\{5, 6\}$ (d) $\{2, 3\}$

5 If : A (0 , 4) , B (-3 , 0) what is the length of $\overline{AB}$?

- (a) 1 units of length. (b) 3 units of length.
(c) 5 units of length. (d) 7 units of length.

6 A factory produces 800 bulbs daily , and if the probability of a bulb being defective is 0.03, what is the expected number of working bulbs produced per day ?

- (a) 24 bulb. (b) 124 bulb. (c) 560 bulb. (d) 776 bulb.

7 If : $5x - 3y = 0$ what is the value of $\frac{x}{y}$?

- (a) $\frac{5}{3}$ (b) $\frac{3}{5}$ (c) $-\frac{3}{5}$ (d) $-\frac{5}{3}$

8 What is the radius of a circle with a circumference of 13π cm. ?

- (a) $\frac{\pi}{2}$ cm. (b) 6.5 cm. (c) 13 cm. (d) 26 cm.

9 If : $X = \{5\}$, then : $n(X^2) = \dots\dots\dots$

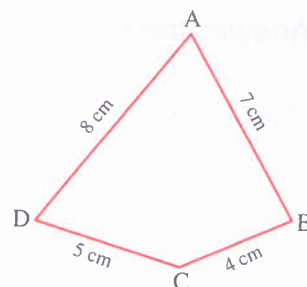
- (a) 1 (b) 2 (c) 10 (d) 25

Second Group :

► Answer the following questions :

1 In the given figure :

Prove that : $m(\angle ABC) > m(\angle ADC)$



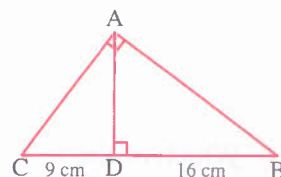
2 If : $f(x) = 3x + b$ and the point $(4, 7)$ lies on the line representing the function f

Find the value of each of : $b, f(1)$

3 If : a, b, c, d are proportional quantities. Prove that : $\frac{a+b}{b} = \frac{c+d}{d}$

4 In the given figure :

Find the length of each of : $\overline{AB}, \overline{AC}, \overline{AD}$



5 A right pentagonal prism made of metal with a base area of 105 cm^2 and a height of 11 cm is melted and formed into identical circular cylinders , each with a height of 2 cm. and a base radius of 3.5 cm.. Find the number of cylinders $(\pi \approx \frac{22}{7})$.

6 What number , when added to each of the numbers 3 , 8 , 18 , makes them proportional ?

7 A student conducted a survey on a sample of 25 students from his school to find out which sport they prefer to practice and recorded the results in the table below :

Sport	Football	Basketball	Volleyball	Total
Number of students		4	2	25

If a student from the school is chosen randomly , find the probability that he prefers to play football. Then find the expected number of students who prefer to play football from the total of 600 students in the school.

Answer the following questions :

First Group :

► Choose the correct answer from those given :

- 1 If the slope of the line passing through the points $(a, 3)$ and $(2, b)$ equals $\frac{1}{2}$, what is the value of a ?
- (a) $4 - 2b$ (b) $8 - 2b$ (c) $2b - 4$ (d) $2b - 8$
- 2 The sample method is suitable for all of the following except
- (a) check the factory's production. (b) check the desert sands.
(c) know the population. (d) patient's blood test.
- 3 Which of the following numbers are proportional ?
- (a) 2, 6, 4 (b) 3, 5, 8 (c) 3, 9, 27 (d) 1, 4, 9
- 4 If : $X = \{2\}$ and $n(Y) = 2$, then : $n(X \times Y) = \dots\dots\dots$
- (a) 1 (b) 2 (c) 4 (d) 8
- 5 If the distance between the points $B(3, 2)$, $A(X, 0)$ equals $2\sqrt{5}$ units of length, then what is the set of possible values of X ?
- (a) $\{-1, 7\}$ (b) $\{7\}$ (c) $\{-4, 4\}$ (d) $\{-4, 7\}$
- 6 What is the solution set of the inequality : $1 < 2X - 3 \leq 5$ in $\mathbb{R}$?
- (a) $]1, 5]$ (b) $[2, 4[$ (c) $]4, 8]$ (d) $]2, 4]$
- 7 What is the diameter length of a circle with an area of 36π square inches ?
- (a) 6 inches (b) 12 inches (c) 18 inches (d) 36 inches
- 8 If : $\frac{a}{5} = \frac{b}{3}$ what is the value of $\frac{a+b}{a-b}$?
- (a) $\frac{8}{3}$ (b) $\frac{5}{3}$ (c) $\frac{1}{4}$ (d) 4
- 9 If : $f(X) = 4 - X$ what is the value of : $f(-4)$?
- (a) -8 (b) 0 (c) 4 (d) 8

Second Group :

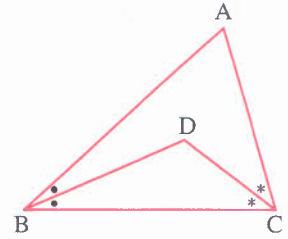
► Answer the following questions :

1 If : $\frac{3a-4b}{3b-4c} = \frac{b-a}{c-b}$ **Prove that :** b is the mean proportional between a , c

2 In the given figure :

AB > AC and $\overrightarrow{BD}$ bisects $\angle ABC$ and $\overrightarrow{CD}$ bisects $\angle ACB$

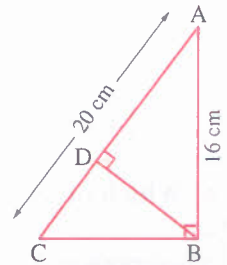
Prove that : BD > CD



3 If R is a relation on X where $X = \{1, 2, 3, 4, 5\}$ and " $x R y$ " means " $x + y = 5$ " for each $x \in X, y \in Y$ write the domain and range of the relation and represent it with an arrow diagram.

4 In the given graph :

Find : The length of the projection of $\overrightarrow{AB}$ on $\overrightarrow{AC}$



5 Find the area of the base of a right pentagonal prism with a height of 8 cm. and a volume of 168 cm^3

6 If : a , b , c , d are proportional quantities. **Prove that :** $\frac{a+b}{a-b} = \frac{c+d}{c-d}$

7 The club plays 30 matches in the league , and if the probability of a draw in one of the matches is 0.2 and the probability of winning is 0.5 , **find :**

- ① The expected number of matches to end in a draw.
- ② The expected number of matches to lose.

Exam

5

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 If : X is the positive mean proportional between the numbers 54 and 24 , what is the value of X ?

- (a) 15 (b) 36 (c) 39 (d) 78

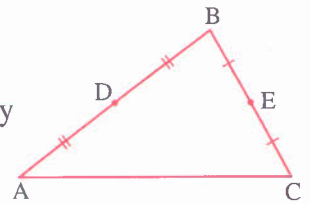
2 If $X = \{1, 2\}$, $Y = \{5, 6\}$, then : $(5, 1) \in \dots\dots\dots$

- (a) $Y \times X$ (b) X^2 (c) $X \times Y$ (d) Y^2

3 In the given figure :

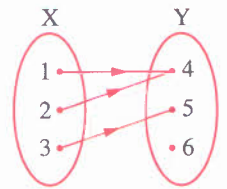
If $D(-1, -2)$, $E(2, 3)$ are the midpoints of $\overline{AB}$, $\overline{BC}$ respectively

What is the length of $\overline{AC}$?



- (a) $\sqrt{34}$ (b) $2\sqrt{34}$ (c) $2\sqrt{5}$ (d) $4\sqrt{5}$

4 The range of the relation represented by the given arrow diagram is



- (a) $\{1, 2, 3\}$ (b) $\{4, 5, 6\}$
(c) $\{4, 5\}$ (d) $\{1, 2, 3, 4, 5\}$

5 Which of the following is a secondary source for data collection ?

- (a) personal interview. (b) questionnaires.
(c) employee database. (d) observation and measurement.

6 Solution set of the inequality : $2x - 3 \leq 5x + 9$ in $\mathbb{R}$ is

- (a) $[4, \infty[$ (b) $[-4, \infty[$ (c) $]-\infty, 4[$ (d) $]-\infty, 4]$

7 What is the slope of the line passing through the points $A(-2, 3)$, $B(5, 7)$?

- (a) $\frac{7}{4}$ (b) $\frac{4}{7}$ (c) $\frac{4}{3}$ (d) $\frac{2}{3}$

8 A right circular cylinder with a base diameter of length 10 cm and a height of 15 cm

What is its volume ?

- (a) $75\pi \text{ cm}^3$ (b) $150\pi \text{ cm}^3$ (c) $375\pi \text{ cm}^3$ (d) $1500\pi \text{ cm}^3$

9 If $\frac{a}{b} = \frac{c}{d} = \frac{2}{3}$, then : $\frac{a+c}{b+d} = \dots\dots\dots$

- (a) $\frac{4}{3}$ (b) $\frac{2}{3}$ (c) $\frac{4}{9}$ (d) $\frac{1}{3}$

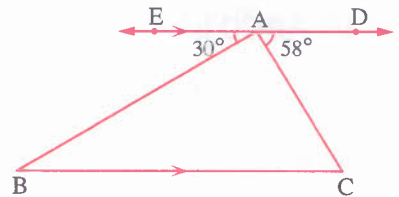
Second Group :

► Answer the following questions :

1 If $x : y = 2 : 5$, find the value of $(10x + 3y) : (5x + 2y)$

2 In the given figure :

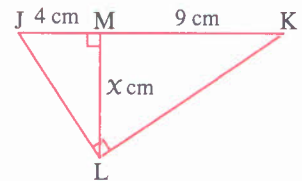
Prove that : $AB > AC$



3 Represent graphically the function f where : $f(x) = 2x + 1$

4 In the given figure :

Find the value of : x



5 An alloy in the shape of a right triangular prism with a right angled triangle base , with the lengths of the legs 9 cm. and 12 cm. and the height of the prism is 20 cm. Melted and formed into cubes , each with an edge length of 3 cm. Find the number of cubes.

6 If : a, b, c, d in a continued proportion. **Prove that** : $\frac{c^2 - d^2}{a - c} = \frac{bd}{a}$

7 When taking a sample of 30 students from 750 students

in one of the schools and asking them about their favorite activity and, their answers were as shown in the given table :

If a student is randomly selected , then what is the probability that the student is one of the swimming activity favorites ? and What is the expected number of students who prefer swimming activity in the school ?

Activity	Frequency
Football	15
Swimming	8
Handball	4
Volleyball	3

Exam 6

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 The linear function f where : $f(x) = 2x - 1$ is represented by a straight line that intersects the y-axis at the point

(a) (0 , 1)

(b) (0 , - 1)

(c) (1 , 0)

(d) (- 1 , 0)

2 If : ABCD is a rectangle in which : A $(-4, -1)$ and C $(4, 5)$ what is the length of $\overline{BD}$?

(a) 4 units of length.

(b) 5 units of length.

(c) 6 units of length.

(d) 10 units of length.

3 If the probability of a team winning any match is 80 % , how many matches are expected to win out of 35 matches ?

(a) 7

(b) 14

(c) 21

(d) 28

4 If : $\frac{3}{m} = \frac{5}{n}$ and $m - n = 6$, what is the value of m ?

(a) 15

(b) 9

(c) -9

(d) -15

5 If the slope of the straight line passing through the two points $(-4, k)$, $(6, -7)$ equals $-\frac{1}{3}$, what is the value of k ?

(a) 23

(b) -23

(c) $\frac{11}{3}$

(d) $-\frac{11}{3}$

6 If : $X = \{1\}$ and $Y = \{2\}$, then : $n(X \times Y) = \dots\dots\dots$

(a) 2

(b) $\{(1, 2)\}$

(c) 1

(d) Zero

7 Which of the following inequalities represents the solution set in $\mathbb{R}$ in the given figure ?



(a) $x > 3$

(b) $x < 3$

(c) $x \geq 3$

(d) $x \leq 3$

8 The radius length of the base of a circular cylinder is 5 cm. and its height is 15 cm. what is surface area of the cylinder ?

(a) $75 \pi \text{ cm}^2$

(b) $200 \pi \text{ cm}^2$

(c) $250 \pi \text{ cm}^2$

(d) $375 \pi \text{ cm}^2$

9 If : $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 3$ what is the value of $\frac{a+b+c}{b+c+d}$?

(a) 1

(b) 3

(c) 9

(d) 6

Second Group :

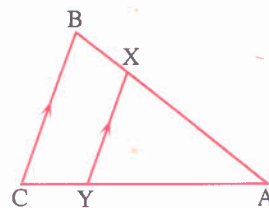
► Answer the following questions :

1 If : $\frac{x}{4} = \frac{y}{5} = \frac{z}{3}$, prove that : $\frac{x-y+2z}{2x+y-z} = \frac{1}{2}$

2 In the given figure :

$AB > BC$, $\overline{XY} \parallel \overline{BC}$

Prove that : $AX > XY$

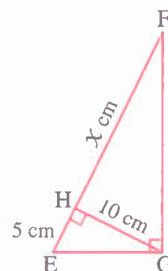


3 If : $X = \{4, 6, 8\}$, $Y = \{-2, -1, 0, 1, 2\}$ and f is a function from X to Y where $f(x) = 4 - \frac{1}{2}x$, write f as a set of ordered pairs , then find the range of the function and graph it.

4 If : b is the mean proportional between a , c then prove that : $\frac{a^2}{b^2} + \frac{b^2}{c^2} = \frac{2a}{c}$

5 In the given figure :

Find the value of : x



6 If the base of a right prism is an equilateral triangle with a side length of 5 cm. and the height of the prism is 8 cm. , find the lateral area of the prism

7 One day , the number of milk cartons sold in one chain of grocery stores was as in the given table , and we expect the total number of cartons sold tomorrow to reach 600 cartons , how many cartons of skim milk are expected to be sold tomorrow ?

Type of yogurt	Number of packages sold
Full cream	100
Semi-skimmed	25
Skimmed	75

Exam 7

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 If : $3a = 6b = 8c$, what is the value of $a : b : c$?

(a) $3 : 4 : 8$

(b) $3 : 6 : 8$

(c) $8 : 4 : 3$

(d) $8 : 6 : 3$

2 If : $X \times Y = \{(2, 3)\}$, then : $X^2 = \dots\dots\dots$

(a) $\{(4, 9)\}$

(b) $\{(4, 3)\}$

(c) $\{(2, 2)\}$

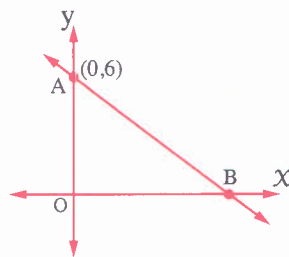
(d) $\{(2, 9)\}$

3 In the given figure :

If the area of the triangle OAB = 24 square units

Then the slope of $\overleftrightarrow{AB}$ equals

- (a) $\frac{3}{4}$ (b) $-\frac{3}{4}$
(c) $\frac{4}{3}$ (d) $-\frac{4}{3}$



4 A circle with a circumference of 10π cm. , what is the area of the circle ?

- (a) 25π cm² (b) 50π cm² (c) 75π cm² (d) 100π cm²

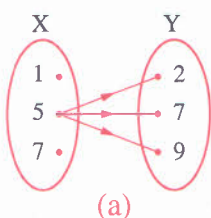
5 If the straight line representing the function f where : $f(x) = ax - 5$ passes through the point (2 , 3) What is the value of a ?

- (a) 8 (b) 6 (c) 4 (d) 2

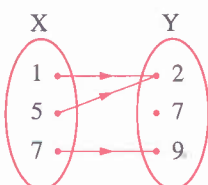
6 If a is the first proportional of the two numbers 4 , 16 what is the value of a ?

- (a) 8 (b) 4 (c) 2 (d) 1

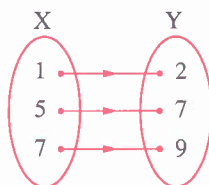
7 Which of the following relations is not a function from X to Y ?



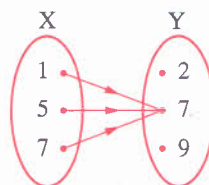
(a)



(b)



(c)



(d)

8 What is the distance between the two points A (5 , - 12) and B (- 19 , 6) ?

- (a) 15 units of length (b) 20 units of length
(c) 25 units of length (d) 30 units of length

9 A hospital with 40 doctors and 200 nurses took a layer sample of size 36 individuals representing each layer according to its size , what is the number of nurses in this sample ?

- (a) 6 nurses (b) 24 nurses (c) 18 nurses (d) 30 nurses

Second Group :

► Answer the following questions :

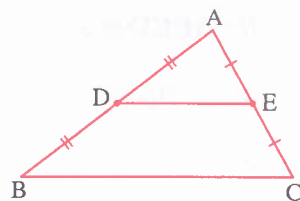
1 If b is the mean proportional between a , c

Prove that : $\frac{a}{c} = \frac{b^2}{c^2}$

2 In the given figure :

If : $AD > AE$

Prove that : $m(\angle C) > m(\angle B)$



3 If : $\frac{x}{2} = \frac{y}{3} = \frac{z}{4} = \frac{3x + 2y - z}{k}$

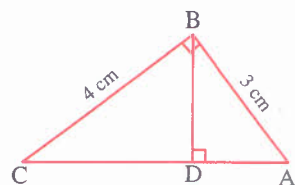
Find the value of : k

4 A quadrilateral prism with a square base of side length 4 cm. and a volume of 192 cm^3
find its surface area.

5 Find the solution set of the inequality : $-8 < 3x - 2 \leq 7$ in $\mathbb{R}$ and represent it on the number line.

6 In the given figure :

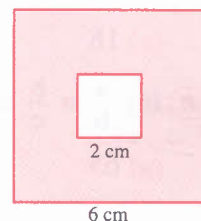
Find the length of the projection of $\overline{BC}$ on $\overleftrightarrow{AC}$



7 In the figure two squares drawn on a board , if a person shoots an arrow and it hits this board. Find the probability of hitting the colored area.

If 90 people each shoot one arrow that hits the board ,

What is the expected number of times the colored area will be hit ?



Exam 8

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 What is the second proportional to the numbers 4 , 6 , 12 ?

- (a) 18 (b) 8 (c) 6 (d) 2

2 The slope of the straight line passing through the points A (3 , -4) and B (-4 , 5) equals

- (a) $\frac{7}{9}$ (b) $-\frac{7}{9}$ (c) $\frac{9}{7}$ (d) $-\frac{9}{7}$

3 If : $X = \{2, 3, 4\}$ and R is a function on X where $R = \{(a, 4), (b, 2), (3, 4)\}$
what is the value of a + b ?

- (a) 4 (b) 5 (c) 6 (d) 7

4 If : ABCD is a square in which : A (-1 , 4) , C (1 , 6) what is the area of the square ABCD ?

- (a) 16 square units. (b) 8 square units.
(c) 4 square units. (d) $\sqrt{2}$ square units.

5 What is the area of the circle whose radius length is 10 m ?

- (a) $5 \pi \text{ m}^2$ (b) $10 \pi \text{ m}^2$ (c) $25 \pi \text{ m}^2$ (d) $100 \pi \text{ m}^2$

6 What is the solution set of the inequality : $-x \geq 3$ in $\mathbb{R}$?

- (a) $]-\infty, -3]$ (b) $]-\infty, 3[$ (c) $]-3, \infty[$ (d) $]3, \infty[$

7 There are 320 workers and engineers in a factory , from which a random sample of 16 workers and engineers was selected , it was found that the number of engineers in the sample is 5 , what is the expected number of engineers in the factory ?

- (a) 50 engineers. (b) 100 engineers.
(c) 160 engineers. (d) 220 engineers.

8 If : $f(x) = x^2$, $g(x) = x + 4$ what is the value of : $5f(2) + 2g(5)$?

- (a) 18 (b) 20 (c) 38 (d) 70

9 If : $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 4$ what is the value of $\frac{a+d}{d}$?

- (a) 65 (b) 49 (c) 37 (d) 25

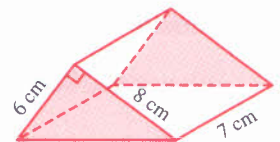
Second Group :

► Answer the following questions :

1 If : b is the mean proportional between a , c , prove that : $\frac{a+2b}{b+2c} = \frac{a-b}{b-c}$

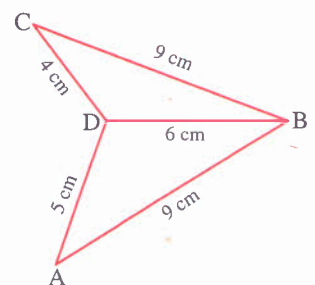
2 In the given figure :

Find the total area.



3 In the given figure :

Compare between $m(\angle ABD)$, $m(\angle CBD)$

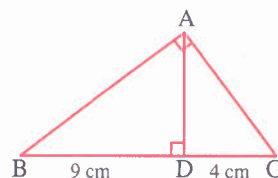


4 If : $X = \{3, 2\}$, $Y = \{2, 4, 6\}$, find : $X \times Y$ and represent it using an arrow diagram.

5 If : $\frac{x}{y} = \frac{3}{5}$, find the value of : $\frac{2x+y}{x+3y}$

6 In the given figure :

Find : The length of $\overline{AD}$



7 Some students in a class wear glasses , and others do not , if a student is randomly selected from this class , and the probability that this student wears glasses is 0.1 , find the probability that this student does not wear glasses , and if the number of students in this class is 40 students , find the expected number of students who wear glasses.

Exam 9

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 If : $\frac{a}{3} = \frac{b}{4}$, what is the value of $\frac{3a-b}{b-a}$?

(a) $\frac{4}{3}$

(b) $\frac{3}{4}$

(c) $\frac{1}{5}$

(d) 5

2 If : $X \times Y = \{(a, 5), (4, 7), (9, b), (9, 5)\}$, then : $X = \dots\dots\dots$

(a) $\{7, 9\}$

(b) $\{4, 7\}$

(c) $\{4, 9\}$

(d) $\{5, 9\}$

3 If the slope of the straight line passing through the two points A $(a+2, 3)$, B $(-a, -9)$ equals 2 What is the value of : a ?

(a) -2

(b) 0

(c) 2

(d) 4

4 A right quadrilateral prism with a square base of side length 10 cm. If the height of the prism is 8 cm. , what is the volume of the prism ?

(a) 80 cm^3

(b) 160 cm^3

(c) 320 cm^3

(d) 800 cm^3

5 In a mixed school there are 1200 students , a random sample of 90 students was selected , and it was found that the number of girls was 54 , what is the expected number of girls in the school ?

- (a) 480 girls (b) 660 girls (c) 720 girls (d) 840 girls

6 The height of a circular cylinder is 6 inches and the length of its base radius equal to half its height , what is its volume in cubic inches ?

- (a) 18π (b) 36π (c) 54π (d) 108π

7 If : $f : \mathbb{R} \longrightarrow \mathbb{R}$ and $f(x) = 7$ what is the value of $\frac{5f(4)}{10f(6)}$?

- (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{7}{3}$ (d) $\frac{7}{2}$

8 What is the solution set of the inequality : $5 > -x > -3$ in $\mathbb{R}$?

- (a) $[-5, 3]$ (b) $] -5, 3[$ (c) $[-3, 5]$ (d) $] -3, 5[$

9 If : $\frac{a}{b} = \frac{b}{c} = \frac{1}{2}$ which of the following is correct ?

- (a) $a = 2c$ (b) $c = 2a$ (c) $a = 4c$ (d) $c = 4a$

Second Group :

► Answer the following questions :

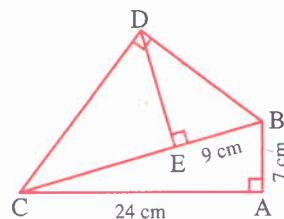
1 If : a, b, c, d are in proportion

Prove that : $\frac{3a-2c}{3b-2d} = \frac{5a+3c}{5b+3d}$

2 Prove that the points A (3 , 2) , B (8 , 7) , C (1 , 4) are the vertices of a right triangle and calculate its area.

3 In the given figure :

Find : The length of $\overline{DB}$

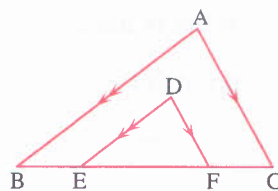


4 If : 3 , $a, b, 24$ in continued proportion , find the value of each of : a, b

5 In the given figure :

If : $AC < AB$

Prove that : $DE > DF$



6 If $X = \left\{ \frac{1}{2}, -1, 0, 1, 2 \right\}$ and R is a relation on X where « $X R y$ » means « $X y = 1$ » for each $x \in X, y \in X$. Write R as a set of ordered pairs and represent it with an arrow diagram. Does R represent a function or not and why ?

7 A random sample consisting of 25 students was selected from the students applying for a mathematics competition in one of the mixed preparatory schools , and the students were distributed as in the given table : Find the probability that the winner is a male student or from the first grade.

	First grade	Second grade	Total
Male student	8	.....	.....
Female student	.....	4	10
Total	.....	.....	.....

And if the total number of students in this competition is 1550 students , what is the expected number of second-grade female students ?

Exam 10

Answer the following questions :

First Group :

► Choose the correct answer from those given :

1 If : $\frac{a}{c+a-b} = \frac{b}{a+b-c} = \frac{c}{b+c-a}$ then each ratio equals

(a) $\frac{1}{3}$

(b) $\frac{1}{2}$

(c) $\frac{2}{3}$

(d) 1

2 $\{3\} \times \{5\} = \dots\dots\dots$

(a) $\{15\}$

(b) $\{3, 5\}$

(c) $(3, 5)$

(d) $\{(3, 5)\}$

3 If the slope of the straight line passing through the two points A $(2, 3)$, $(k, -6)$ is $-\frac{3}{2}$

What is the value of : k ?

(a) 2

(b) 4

(c) 6

(d) 8

- 4 What is the area of the circle whose center is the point A $(-3, 5)$, and passes through the point B $(9, -4)$?
- (a) 15π square units (b) 225π square units
(c) 13π square unit (d) 144π square unit
- 5 The interval $[-1, 2[$ is the solution set in $\mathbb{R}$ for the inequality
- (a) $-1 < x < 2$ (b) $-1 < x \leq 2$ (c) $-1 \leq x < 2$ (d) $-1 \leq x \leq 2$
- 6 If : $X = \{5, 7, 8\}$, $Y = \{9, 10\}$ and R is a function from X to Y where $R = \{(5, 9), (8, 9), (k, 9)\}$, what is the value of k ?
- (a) 5 (b) 7 (c) 8 (d) 9
- 7 The volume of a right circular cylinder is $320\pi \text{ cm}^3$ and its height is 20 cm. , What is the length of its base diameter ?
- (a) 2 cm. (b) 4 cm. (c) 8 cm. (d) 16 cm.
- 8 If b is the proportional mean between $(3 + \sqrt{2})$, $(12 - \sqrt{32})$, what is the value of b ?
- (a) $\pm\sqrt{7}$ (b) $\pm 2\sqrt{7}$ (c) $\pm 4\sqrt{7}$ (d) $\pm 16\sqrt{7}$
- 9 If the probability of scoring a goal from a penalty in a handball match is 60 % , what is the expected number of goals to be scored when 30 penalties are taken ?
- (a) 9 (b) 12 (c) 18 (d) 30

Second Group :

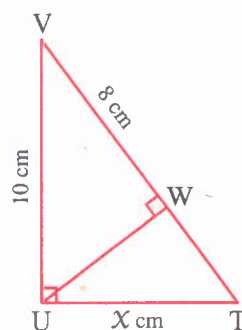
► Answer the following questions :

- 1 If b is the mean proportional between a , c

Find that : $\frac{4a^2 - 9b^2}{4b^2 - 9c^2} = \frac{a}{c}$

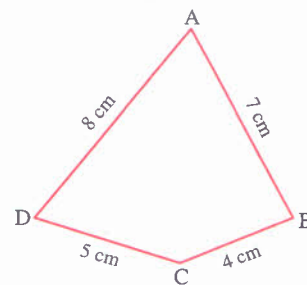
- 2 In the given figure :

Find the value of : x



3 In the given figure :

Prove that : $m(\angle ABC) > m(\angle ADC)$

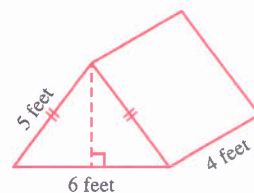


4 If $f(x) = ax + 3$ and the line representing the function f intersects the x -axis at the point $(\frac{3}{4}, 0)$, find the value of each of : a , $f(-1)$

5 If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$ and : $x + y - 2z = 12$

Find the value of : z

6 Find the volume of the given right prism.



7 A random sample from a school consists of 24 boys and 16 girls, there are 9 boys and 4 girls wear glasses. If a person is randomly selected from this school, find the probability that this person is a boy who does not wear glasses, and if the total number of students in the school is 440, find the expected number of boys who do not wear glasses in the school.

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



حمل الآن

مجانا وحصريا

امتحانات رقم (2)

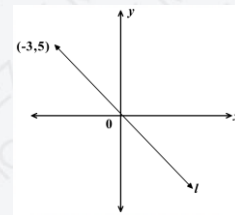
الترم الثاني



Model (1)

Question 1 : Choose the correct answer :

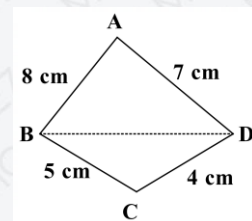
- ① What is the solution of the inequality $-X > 4$ in R
 - (a) $] -\infty, -4[$
 - (b) $] -\infty, 4[$
 - (c) $] -4, \infty[$
 - (d) $] 4, \infty[$
- ② What is the distance between the two points $(4,7)$, $(1,11)$?
 - (a) 5 length units
 - (b) 6 length units
 - (c) 7 length units
 - (d) 8 length units
- ③ What is the third proportional to the numbers $x^3, 2x^2$?
 - (a) $2x$
 - (b) $4x$
 - (c) x^2
 - (d) $2x^5$
- ④ The domain of the relation $R = \{(1,2), (1,3), (4,2), (4,3)\}$
 - (a) $\{3,2\}$
 - (b) $\{1,4\}$
 - (c) $\{1,2,3,4\}$
 - (d) $\{3,4\}$
- ⑤ If the probability of team winning any match is 80% how many matches is the team expected to win out of a total of 35 matches?
 - (a) 7
 - (b) 14
 - (c) 21
 - (d) 28
- ⑥ In the given figure: what is the slope of the line l
 - (a) $\frac{5}{3}$
 - (b) $\frac{3}{5}$
 - (c) $-\frac{5}{3}$
 - (d) $-\frac{3}{5}$



- ⑦ If: $(x^3, y + 1) = (27, \sqrt[3]{27})$, what is the value of $x+y$?
 - (a) 5
 - (b) 4
 - (c) 3
 - (d) 2
- ⑧ What is the radius of a circle with a circumference of 13π cm
 - (a) $\frac{\pi}{2}$ cm
 - (b) 6.5cm
 - (c) 13cm
 - (d) 26cm
- ⑨ If $x = \{2\}$, and $n(y) = 2$, then: $n(x_x y) =$
 - (a) 1
 - (b) 2
 - (c) 4
 - (d) 8

Question 2 : Answer the following questions :

- ① In the given figure :
Prove that: $m(\angle ABC) > m(\angle ADC)$



2 If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, $x + y - 2z = 12$
Find the value of z

3 If $A = \{1, 7, 9\}$, $B = \{2, 4, 7\}$, $C = \{1, 7\}$ find:

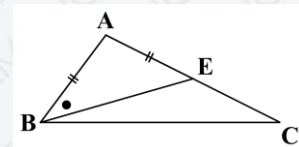
a) $A \times C$ and represent it by arrow diagram

b) $B \times (A \cup C)$

4 Represent graphically the function f which
 $F(x) = x + 4$

5 In the opposite figure:-

$C \in \overline{AE}$, $\overline{AB} = \overline{AE}$, Prove: $m(\angle ABE) > m(\angle C)$

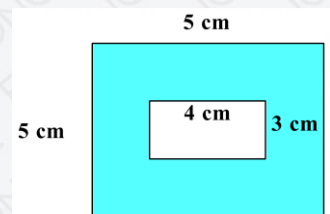


6 If a, b, c, d is a continued proportion : Prove that: $\frac{c^2 - d^2}{a - c} = \frac{bd}{a}$

7 If a person shoots an arrow at this board and hit it:-

1) Find the probability of hitting the colored region

2) If 75 people each throw one arrow, what is the expected number of times the shaded area will be hit



Model (2)

Question 1 : Choose the correct answer :

1 The mean proportion of the numbers 48 and 3 is

(a) ± 6

(b) ± 12

(c) ± 144

(d) ± 1

2 One of the methods of data collection..

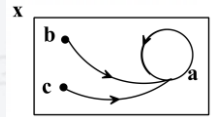
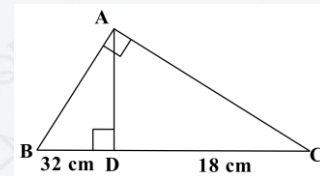
(a) Mass population

(b) Primary

(c) historical

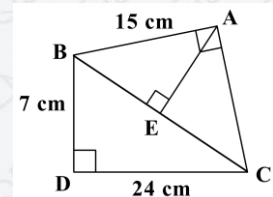
(d) Secondly

- 3 Which of the following numbers are proportional?
 (a) 2.6.4 (b) 8.5.3 (c) 3.9.27 (d) 4.9.1
- 4 If ABC is a triangle where $m(\angle B) = 30^\circ, m \angle A = 100^\circ$ then
 (a) $AB < BC$ (b) $AB > BC$ (c) $AC > AB$ (d) $AC = BC$
- 5 The slope of the line perpendicular to the x-axis
 (a) 0 (b) 1 (c) Undefined (d) -1
- 6 If the probability of scoring a goal from a penalty in a handball match is 60% , what is the expected number of goals to be scored when 30 penalties are taken
 (a) 9 (b) 12 (c) 18 (d) 30
- 7 In the opposite figure: AD= cm
 (a) 12 (b) 144
 (c) 24 (d) 36
- 8 The distance of the point A(-7,24) from the origin equals units
 (a) 12 (b) 25 (c) 15 (d) 20
- 9 The opposite figure represents a function on x then the range=.....
 (a) {a, b, c} (b) {a, b}
 (c) {b, c} (d) {a}

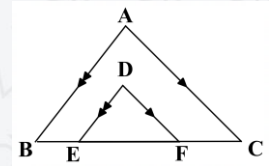


Question 2 : Answer the following questions :

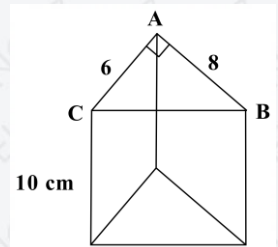
- 1 If f is a function on x where $x = \{3, 4, 5, 6\}$
 $F(6) = 5, F(5) = 5, F(4) = 5, F(3) = 3$
 Represent of by an arrow diagram, and write the relation R as a set of ordered pairs then find its range.
- 2 If $f(x) = 5x + b, f(2) = 12$
 Find the value of $b^2 - 2b - 10$
- 3 In the opposite figure ABC is a right - angled triangle at A
 BDC is a right - angled at D
 $\overline{AE} \perp \overline{BC}$
 Find BC, AC, AE



- 4 If A (3,1), B (-5,1), C (-1,4) prove that the points A,B,C are not collinear .
- 5 Find the area of the circle whose center is the point M(-3,2) and passes through the point A(3,-6)
- 6 In the given figure : If $AC < AB$, Prove that : $\overline{DE} > \overline{DF}$



- 7 In the figure: a right triangle of prism with a height 10 cm and a base that is a right triangle , with the lengths of the legs being 6 cm , 8 cm .
Find the lateral area of the prism.



Model (3)

Question 1 : Choose the correct answer :

- 1 One of the secondary sources of data collection is:
- (a) Personal interview. (b) Questionnaire
- (c) Observation and measurement (d) Internet
- 2 The base of a right prism in the shape of a square with side length 5 cm, and its height is 6 cm , what is its lateral area ?
- (a) 30 cm^2 (b) 120 cm^2 (c) 150 cm^2 (d) 170 cm^2
- 3 If : $\frac{a}{b} = \frac{2}{7}$ what is the value of $\frac{2b}{7a}$?
- (a) $\frac{4}{49}$ (b) $\frac{2}{7}$ (c) 1 (d) $\frac{49}{4}$
- 4 If : $x = \{2,3\}$, $n(X \times y) = 6$, then : $n(y^2) =$
- (a) 3 (b) 4 (c) 9 (d) 16
- 5 A factory produces 800 bulbs daily and if the probability of a bulb being defective is 0.03 , what is the expected numbers of working bulbs produced per day ?

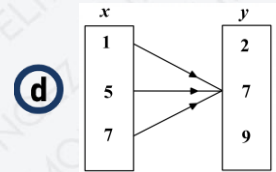
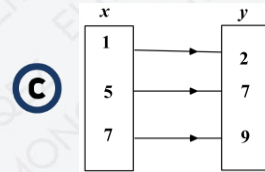
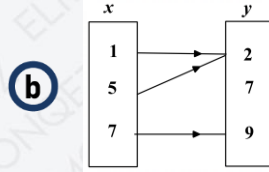
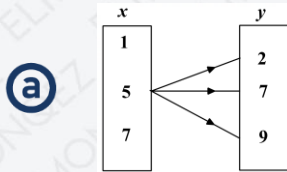
(a) 24 bulb

(b) 124 bulb

(c) 560 bulb

(d) 776 bulb

6 Which of the following relations is not a function from



7 If the straight line representing the function f where: $f(x) = (ax-5)$ passes through the point $(2,3)$, what is the value of a ?

(a) 8

(b) 6

(c) 4

(d) 1

8 What is the solution set of the inequality: $3x + 7 \leq 10$ in $\mathbb{R}$?

(a) $[1, \infty[$

(b) $]0, \infty[$

(c) $] -\infty, 1]$

(d) $] -\infty, 0[$

9 If: $f(x) = 4-x$ what is the value of: $f(-4)$?

(a) -8

(b) 0

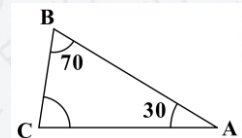
(c) 4

(d) 8

Question 2 : Answer the following questions :

1 If $A(0,6)$, $B(6,0)$, $C(2,-4)$, $D(-4,2)$ prove that the points A, B, C, D are the vertices of a rectangle.

2 ABC is a triangle in which $m(\angle A) = 30^\circ$, $m(\angle B) = 70^\circ$ arrange the side lengths of a triangle in a descending order



3 If $f(x) = 2x + K$, the point $(3,11)$ lies on the straight line which represent the function f .

Find the value of $f(2)$, K

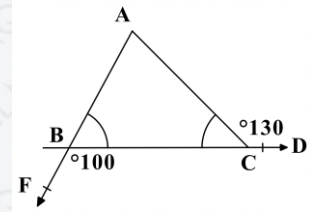
4 If $a:b:c = 2:3:4$ and $a^2 + b^2 + c^2 = 725$

Find the value of $b + a - c$

- 5 A random sample of 50 students was selected from a school among the students who participated in the mathematics competition, and the students were distributed as shown in the following table:

	First	Second	Total
Male student	8	...	...
Female student	....	4	10
Total	....	....	.....

- 6 ABC is a triangle in which $D \in \overrightarrow{BC}, F \in \overrightarrow{AB}$
 $m(\angle ACD) = 130^\circ, m(\angle FBC) = 100^\circ$
 Prove that $AC > AB$

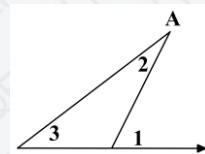


- 7 If $x : y = 2 : 5$, find the value of $(10x + 3y) : (5x + 2y)$

Model (4)

Question 1 : Choose the correct answer :

- 1 In the opposite figure
 If $m(\angle 3) < m(\angle 2)$, which of the following is correct?



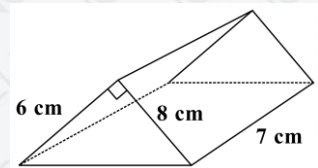
- (a) $m(\angle 3) < m(\angle 2) < m(\angle 1)$ (b) $m(\angle 1) < m(\angle 3) < m(\angle 2)$
 (c) $m(\angle 3) < m(\angle 1) < m(\angle 2)$ (d) $m(\angle 2) < m(\angle 3) < m(\angle 1)$
- 2 If $f: R \rightarrow R$ and $f(x) = 3x$ then $f(6)$?
- (a) 3 (b) 6 (c) 9 (d) 21
- 3 If the probability of football team winning is 0.8 how many matches are expected to won out of 30 matches?
- (a) 15 (b) 18 (c) 24 (d) 27
- 4 What is the solution set of $\sqrt{2}x + 1 = 3$ in R
- (a) $\{2\}$ (b) $\{1\}$ (c) $\emptyset$ (d) $\{\sqrt{2}\}$

- 5 The straight line that represent the function f which $f(x) = 2 \times -6$, cut x – axis in the point
- (a) (0,3) (b) (0,6) (c) (6,0) (d) (3,0)
- 6 If $(x^5, y + 1) = (243, \sqrt[3]{64})$, then $x - y =$
- (a) 5 (b) 2 (c) 4 (d) 0
- 7 Data collection sources are divided into primary sources and sources
- (a) Samples (b) Stratified (c) Historical (d) Secondary
- 8 If $\frac{a}{c+a+b} = \frac{b}{a+b-c} = \frac{c}{b+c-a}$ then each ratio equals
- (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) 1
- 9 If the slope of the straight line passing through the two points $A(a + 2, 3), B(-a, -9)$
- (a) -2 (b) 0 (c) 2 (d) 4

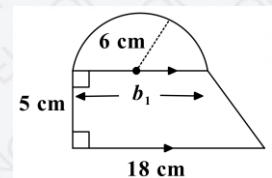
Question 2 : Answer the following questions :

- 1 What number, when added to each of the numbers 3,8,18 makes then proportional?

- 2 In the given figure : Find the total area.



- 3 Find the area of the figure: ($\pi = \frac{22}{7}$)



- 4 Find the S.S of the following inequality in R and represent it on the number line $5 - 3x \geq 2$

- 5 If b is the mean proportional between a and c

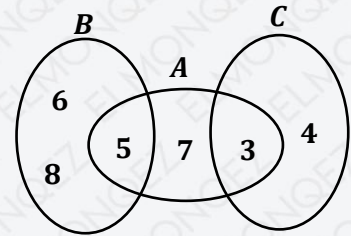
Prove that $\frac{a-c}{a+b} = \frac{a-2b+c}{a-b}$

6 using the opposite venn diagram find

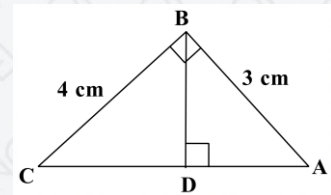
a) $(A \cap C) \times B$

b) $(C \cup B) \times A$

c) $(A \cap B) \times C$



7 In the given figure : Find the length of the projection of $\overrightarrow{BC}$ on $\overrightarrow{AC}$



Model (5)

Question 1 : Choose the correct answer :

1 If: $f(x) = 5$, then: $3f(-5) = \dots\dots\dots$

(a) 15

(b) -2

(c) -15

(d) -25

2 What is the slope of line passing through the points A(3,2) , B(4,2) ?

(a) 2

(b) 1

(c) 0

(d) undefined

3 The sample method is suitable for all of the following except

(a) check the factory's production

(b) check the desert sands

(c) know the population

(d) patient's blood test

4 If $R = \{(1,3), (2,5), (4,3)\}$ is a function then the domain is

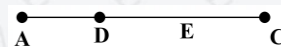
(a) {1,2,4}

(b) {3,4,5}

(c) N

(d)

5 In the opposite figure A, D, E and C lies on the same straight line and $EC < AD$
Then AE DC



(a) >

(b) <

(c) =

(d) ≥

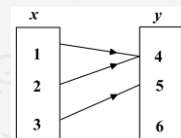
6 The range of the relation Represented by the given arrow diagram:

(a) {1,2,3}

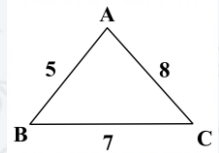
(b) {4,5,6}

(c) {4,5}

(d) {1,2,3,4,5}

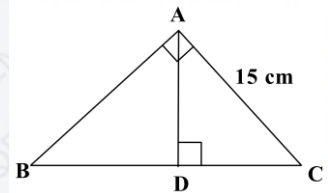


- 7 Two Circles have areas 49π and 64π square units. What is the ratio of their circumference?
- (a) 4:7 (b) 1:2 (c) 16:9 (d) 7:8
- 8 In triangle ABC, If $AB = 5$ cm, $BC = 7$ cm, $CA = 8$ cm then
- (a) $m(\angle A) < m(\angle B)$ (b) $m(\angle A) > m(\angle B)$
(c) $m(\angle A) = m(\angle B)$ (d) $m(\angle C) > m(\angle B)$
- 9 There are 320 workers and engineers in a factory, from which a random sample of 16 workers and engineers was selected. It was found that the number of engineers in the sample is 5. What is the expected number of engineers in the factory?
- (a) 50 engineers (b) 100 engineers
(c) 160 engineers (d) 220 engineers

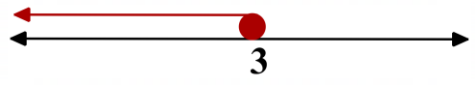


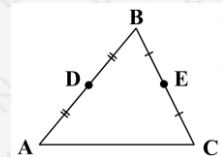
Question 2 : Answer the following questions :

- 1 If $\frac{a}{3} = \frac{b}{4} = \frac{c}{5} = \frac{4a+mb+5c}{25}$ find the value of m
- 2 If $(x - 4, 9) = (5, x + y)$ find the value of $\sqrt{4x + 2y}$
- 3 Find the value of x if the number x, 24, 144 are proportional
- 4 If $x = \{1, 3, 5\}$ and R is a function on x where: $R = \{(a, 3), (b, 1), (1, 5)\}$ find $(a + b)$
- 5 In the opposite figure:
ABC is a triangle its area $150 m^2$ find AB, AD
- 6 One of the car factories produces 3 models of cars in a year and its count is 500 cars of the first model, 700 of the second model, 300 of the third model. If the factory management wants to take a sample size of 105 cars from its total production represented in each model according to its production size, find the number of units of each model in the sample.
- 7 Prove that: the points $A(1, 2), B(2, 4), C(-3, -6)$ are collinear



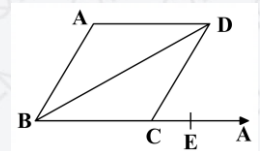
Question 1 : Choose the correct answer :

- 1 If x is the positive mean propetione between the numbers 54 and 24 , what is the value of x ?
 (a) 15 (b) 36 (c) 39 (d) 78
- 2 If $\frac{a}{b} = \frac{b}{c} = 2$ which of the following is correct ?
 (a) $a = 2c$ (b) $a = 4c$ (c) $a = 4b$ (d) $a = 2b$
- 3 A right pentagonal prism has a regular pentagon base whose area is 10 m^2 , and the area of one lateral rectangle is 9 m^2 , then the total surface area of the prism.
 (a) 19 m^2 (b) 38 m^2 (c) 55 m^2 (d) 65 m^2
- 4 $\{3\} \times \{5\} = \dots\dots\dots$
 (a) $\{3,5\}$ (b) $\{(3,5)\}$ (c) $\{15\}$ (d) $(3,5)$
- 5 Which of the following represents the solution set in $\mathbb{R}$ in the given figure?

 (a) $x > 8$ (b) $x < 3$ (c) $x \geq 3$ (d) $x \leq 3$
- 6 If $3a = 5b = 4c$, then $a : b : c$ equal .
 (a) 20:12:15 (b) 9:12:16 (c) 15:10:9 (d) 8:5:3
- 7 If $\frac{b}{3} = \frac{9}{5}$ then $\frac{a-b}{a+b} =$
 (a) $\frac{2}{5}$ (b) $\frac{1}{4}$ (c) 4 (d) $\frac{5}{8}$
- 8 The ordered pair $(0, 3)$ belongs to the function F where:
 (a) $f(x) = 2x + 1$ (b) $f(x) = 3x - 1$
 (c) $f(x) = x + 3$ (d) $f(x) = 3x$
- 9 In the given figure :
 If $D(-1, -2)$, $E(2,3)$ are the midpoints of $\overline{AB}$, $\overline{BC}$ respectively
 what is the length of $\overline{AC}$?
 (a) $\sqrt{34}$ (b) $2\sqrt{34}$
 (c) $2\sqrt{5}$ (d) $4\sqrt{5}$



Question 2 : Answer the following questions :

- 1 If $\frac{2x+3}{2x-3} = \frac{2y+5}{2y-5}$
Find the value of $x : y$
- 2 Find the area of the circle whose center is $M(-3,2)$ and which passes through the point $A(3 - 6)$
- 3 If b is the middle proportional between a and c prove that: $\frac{a}{c} = \frac{4a^2+9b^2}{4b^2-9c^2}$
- 4 A triangle with side length 9 cm , $(3x + 5)\text{cm}$, 20 cm
what are the possible value of x ?
- 5 In the opposite figure:
ABCD is a parallelogram, $E \in \overrightarrow{AC}$ prove: $m(\angle DCE) > m(\angle ADB)$
- 6 If the quantities $35, 15, 3, 2x + 1$ are proportional, find the numerical value of x
- 7 A hospital has 100 doctors and 200 nurses a layer sample of 60 individuals was taken, representing each layer according to its size. calculate number of nurses



Model (7)

Question 1 : Choose the correct answer :

- 1 In the rhombus ABCD, the diagonals intersect at E, If $AC > BD$, then $BE \dots AE$
 - (a) $>$
 - (b) $=$
 - (c) $<$
 - (d) $\geq$
- 2 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 5$ then the value of $\frac{a+b+c}{b+c+d}$ is
 - (a) 15
 - (b) 5
 - (c) 25
 - (d) 1

- 3 If $x = \{1,3\}$, $y = \{2,8\}$ then $(1,1) \in \dots\dots\dots$
- (a) $x \times y$ (b) $y \times x$ (c) x^2 (d) y^2
- 4 If : $X \times Y = \{(2,3)\}$, then $X^2 =$
- (a) $\{(4,9)\}$ (b) $\{(4,3)\}$ (c) $\{(2,2)\}$ (d) $\{(2,9)\}$
- 5 If the slope of the line passing through the points $(4, k)$ and $(3, 2)$ equals 6 then the value of k ?
- (a) 4 (b) 6 (c) 8 (d) 10
- 6 The lateral surface area of right triangular prism whose base sides are 3 cm, 4cm, 5 cm and whose height is 8 cm =
- (a) 120 cm^2 (b) 108 cm^2 (c) 50 cm^2 (d) 96 cm^2
- 7 If $A(-4,1)$ and $B(1,13)$ then the length of $\overline{AB}$ equals Units
- (a) 20 (b) 13 (c) 25 (d) 10
- 8 Which of the following Cartesian product does the point $(\frac{1}{5}, \sqrt{5})$ belong to ?
- (a) $N \times N$ (b) $Z \times Z$ (c) $Q \times Q$ (d) $R \times R$
- 9 If : $n(x^2) = 9$, $n(x \times y) = 12$, then $n(y^2)$
- (a) 6 (b) 9 (c) 10 (d) 16

Question 2 : Answer the following questions :

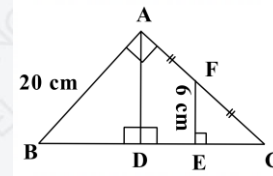
- 1 If the following numbers are in proportional: 4,5, x , 20 find the value of x
- 2 If a,b,c,d are in continued proportion prove that: $\frac{c^2-d^2}{a-c} = \frac{bd}{a}$
- 3 Find the solution set of the following Inequality in R and represent it on the number line $4x - 1 \leq 5x - 3 \leq 4x + 5$
- 4 If $C = \{1,7\}$, $B = \{2,4,7\}$, $A = \{1,9,7\}$ find
- 1) $B \times (A - C)$ 2) $(A \cap B) \times C$
- 5 If $\frac{a+b+c}{11} = \frac{a-b}{11} = \frac{a+b}{25}$ find the ratio $a : b : c$

6 In the opposite figure :

$$m(\angle BAC) = 90^\circ, \overline{AD} \perp \overline{BC}$$

$$FA = FC, AB = 20 \text{ cm}, EF = 6 \text{ cm}.$$

Find : EC



7 If $3x = 5y$ find the value of $\frac{7x+3y}{x+2y}$

Model (8)

Question 1 : Choose the correct answer :

1 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$ then $\frac{a+d}{d} =$

- (a) 9 (b) 7 (c) 8 (d) 9

2 If $R = \{(1,3), (2,3), (4,3)\}$ represent a function then the domain =

- (a) Z (b) N (c) {3} (d) {4,2,1}

3 If b is the mean proportional between $(3 + \sqrt{2})$, $(12 - \sqrt{32})$, what is the value of b ?

- (a) $\pm\sqrt{7}$ (b) $\pm 2\sqrt{7}$ (c) $\pm 4\sqrt{7}$ (d) $\pm 16\sqrt{7}$

4 If $f: R \rightarrow R, f(x) = 3$ find the value of $f(6) + f(1)$

- (a) 3 (b) 6 (c) 7 (d) 9

5 In the opposite figure A, B, D and C lie on the same straight line, and $CE < AD$ then $AE \dots DC$



- (a) $>$ (b) $<$ (c) $=$ (d) $\geq$

6 What is the slope of line passing through the points $A(5,4), B(-2,-3)$

- (a) $\frac{4}{5}$ (b) $\frac{1}{3}$ (c) -1 (d) 1

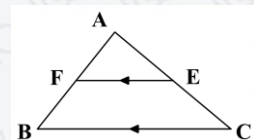
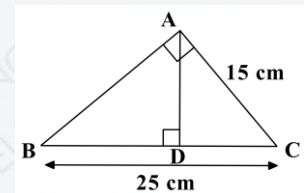
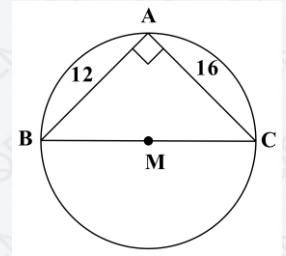
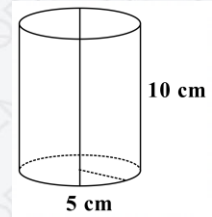
7 The interval $[-1, 2[$ is the solution set in $\mathbb{R}$ for the inequality

- (a) $-1 \leq x < 2$ (b) $-1 < x < 2$
(c) $-1 < x \leq 2$ (d) $-1 \leq x \leq 2$

- 8 If the school's media team consists of 24 members, including 6 teachers, 8 girls, and 10 boys, and a member is chosen at random to give a speech for the opening of the Grand Egyptian Museum, what is the probability that the member is a boy or a teacher?
- (a) $\frac{1}{4}$ (b) $\frac{2}{3}$ (c) $\frac{7}{12}$ (d) $\frac{1}{3}$
- 9 The circumference of a circle with a diameter of 20 cm =
- (a) $20 \pi \text{ cm}$ (b) $10 \pi \text{ cm}$ (c) $20 \pi \text{ cm}^2$ (d) $40 \pi \text{ cm}^3$

Question 2 : Answer the following questions :

- 1 In the figure of a right cylinder with a radius of 5 cm and a height of 10 cm find the volume of the cylinder
- 2 In the opposite figure $AB = 12 \text{ cm}$ $AC = 16 \text{ cm}$ find the area and circumference of circle M in term of π
- 3 Find the third proportional for the quantities 12, 28, 35
- 4 In the opposite figure, find:
- 1) The length of $\overline{AB}$
 - 2) The projection of $\overline{AC}$ on $\overline{BC}$
 - 3) The projection of $\overline{AD}$ on $\overline{BC}$
 - 4) The length of the projection of $\overline{AC}$ on $\overline{BC}$
- 5 If $x = \{1,5,6\}$, $y = \{5,7\}$, $z = \{2,3,5\}$ find $(x \times z)$ and represent it by arrow diagram
- 6 In the opposite figure:
 $\overline{BC} // \overline{FE}$, $\overline{AC} > \overline{AB}$
Prove that: $m(\angle AFE) > m(\angle AEF)$



7

Find the solution set in $\mathbb{R}$ for the equation $12 + 4x = 2(3 + 3x)$

Model (9)

Question 1 : Choose the correct answer :

1

If a is the first proportional for the two numbers 6, 9 find the value of a

- (a) 64 (b) 20 (c) 4 (d) 1

2

In the rhombus $ABCD$, the diagonals intersect at E if $AC > BD$, then BE

- (a) $>$ (b) $<$ (c) $=$ (d) $\geq$

3

The linear function f where : $f(x) = 2x - 1$ is represented by a straight line that intersects the y -axis at the point:

- (a) $(0,1)$ (b) $(-1,0)$ (c) $(1,0)$ (d) $(0,-1)$

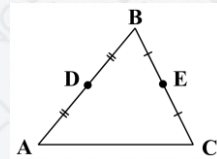
4

In the given figure :

$D(-1, -2), E(2,3)$ are the midpoints of $\overline{AB}, \overline{BC}$ respectively

Find the length of $\overline{AC}$

- (a) $3\sqrt{34}$ (b) $2\sqrt{5}$ (c) $4\sqrt{5}$ (d) $2\sqrt{34}$



5

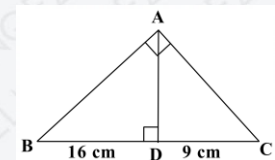
If : $x, y = \{(8,5), (4,7), (a,b), (a,5)\}$ then : $x =$

- (a) $\{7,9\}$ (b) $\{4,9\}$ (c) $\{4,7\}$ (d) $\{5,9\}$

6

In the opposite figure $AD =$

- (a) 12 (b) 144 (c) 24 (d) 36



7

The volume of a right circular cylinder with a base radius of 5 cm and a height of 7 cm

- (a) $150\pi\text{cm}^3$ (b) $128\pi\text{cm}^3$ (c) $175\pi\text{cm}^3$ (d) $40\pi\text{cm}^3$

8

A right circular cylinder with a base diameter of length 10 cm and a height of 15 cm. What is its volume?

- (a) $75\pi\text{cm}^3$ (b) $150\pi\text{cm}^3$ (c) $375\pi\text{cm}^3$ (d) $1500\pi\text{cm}^3$

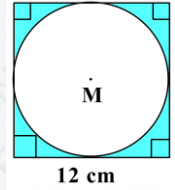
9

Find the solution set of the inequality $3x \leq 21$ in $\mathbb{R}$

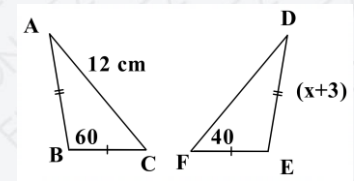
- (a) $] -\infty, 7[$ (b) $] 7, \infty[$ (c) $[7, \infty[$ (d) $] -\infty, 7]$

Question 2 : Answer the following questions :

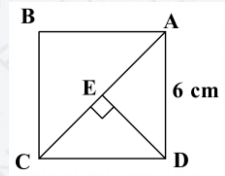
- 1 A right triangular prism with a height of 10 cm and a base that is a right triangle with the length of the less being 6 cm, 8 cm find the lateral are of the prism
- 2 Circle M touches the sides of squares ABCD from the inside where $AD = 12 \text{ cm}$ find the circumference and area of the shaded region ($\pi = 3.14$)



- 3 In the opposite figure:
Find all possible value of x

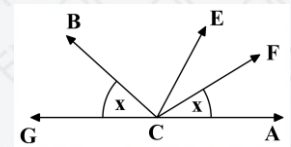


- 4 ABCD is a rectangle its area is 48 cm^2 $DE \perp AC$, $AD = 6 \text{ cm}$ find CD, AC, ED

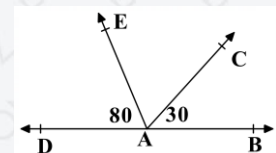


- 5 Draw a circle N with a diameter of 6 m

- 6 In the opposite figure :
 $m(\angle GCB) = m(\angle ACF)$, $C \in \overline{GA}$ and
 $m(\angle ECG) > m(\angle ECA)$
prove that : $m(\angle ECB) > m(\angle ECF)$



- 7 In the opposite figure:
 $\overrightarrow{DB}$, $m(\angle CAB) = 30^\circ$, $m(\angle EAD) = 80^\circ$ prove that $m(\angle DAC) > m(\angle BAE)$



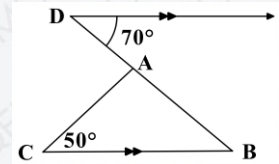
Question 1 : Choose the correct answer :

- 1 The length of projection of line segment a aparallel straight line to it the length of the original line segment
 (a) $<$ (b) $>$ (c) $=$ (d) $\neq$
- 2 If $x = \{5,7,8\}$, $y = \{9,10\}$ and R is a function from x to y where $R = \{(5, a), (8,9)(k, a)\}$ What is the value k ?
 (a) 5 (b) 8 (c) 9 (d) 7
- 3 The slop of the straight line passing through the two points A (2, 3), (k, -6) is $-\frac{3}{2}$ what is the value of k ?
 (a) 2 (b) 4 (c) 6 (d) 8
- 4 The volume of a right circular cylinder is $320 \pi \text{ cm}^3$ and its height is 20 cm what is the length of it's base diameter
 (a) 2 cm (b) 4 cm (c) 8 cm (d) 16 cm
- 5 If $f: R \rightarrow R$ and $f(x) = 7$ what is the value of $\frac{5f(4)}{10f(6)}$?
 (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{7}{3}$ (d) $\frac{7}{2}$
- 6 If $5x - 2y = 0$ what is the value of $\frac{x}{y}$?
 (a) $-\frac{5}{2}$ (b) $-\frac{2}{5}$ (c) $\frac{5}{2}$ (d) $\frac{2}{5}$
- 7 What is the solution set of the inequality $5 > -x > -3$ is R ?
 (a) $[-5,3]$ (b) $] - 5,3[$ (c) $[-3,5]$ (d) $] - 3,5[$
- 8 The length of any side in a triangle The sum of the length of the other two sides
 (a) $>$ (b) $<$ (c) $=$ (d) Otherwise
- 9 A right circular cylinder has radius of base 5 cm and height 10 cm. Find its total surface area.
 (a) $150 \pi \text{ cm}^2$ (b) $200 \pi \text{ cm}^2$ (c) $300 \pi \text{ cm}^2$ (d) $600 \pi \text{ cm}^2$

Question 2 : Answer the following questions :

- 1 A right circular cylinder has a base radius of 12 cm and a height of 22 cm. If the base radius increases by 25% while the height remains constant, calculate the volume of the cylinder after the increase.
- 2 If $X = \{4,5,6,7\}$ and $Y = \{1,2,3,4\}$ and R is a relation from X to Y , where xRy means: $x + y = 8$ for every $x \in X, y \in Y$
 - 1) Write the relation as a set of ordered pairs.
 - 2) Represent the relation using an arrow diagram.
 - 3) State the domain and range of the relation.

- 3 In the opposite figure, prove that: $AC > AB$



- 4 If the slope of the straight line passing through two points $A(a + 2, 3)$ and $B(-a, -9)$ equal 2 find the value of a

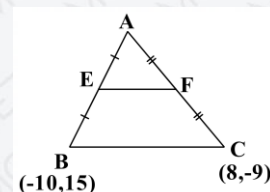
- 5 If b is the mean proportional between a and c , then prove that : $\frac{a^2}{b^2} + \frac{b^2}{c^2} = \frac{2a}{c}$

- 6 A student conducted a survey on a sample of 25 students from his school to find out which sport they prefer to practice and recorded the results in the table below

Sport	Football	Basketball	Volleyball	Total
Number of students		4	2	25

If a student from the school is chosen randomly, find the probability that he prefers to play football. Then find the expected number of students who prefer to play football from the total of 600 students in the school.

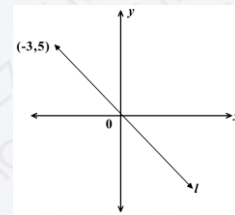
- 7 In the opposite figure , find EF



Model (1)

Question 1 : Choose the correct answer :

- ① What is the solution of the inequality $-X > 4$ in R
 - (a) $]-\infty, -4[$
 - (b) $] - \infty, 4[$
 - (c) $] - 4, \infty[$
 - (d) $]4, \infty[$
- ② What is the distance between the two points $(4,7), (1,11)$?
 - (a) 5 length units
 - (b) 6 length units
 - (c) 7 length units
 - (d) 8 length units
- ③ What is the third proportional to the numbers $x^3, 2x^2$?
 - (a) $2x$
 - (b) $4x$
 - (c) x^2
 - (d) $2x^5$
- ④ The domain of the relation $R = \{(1,2), (1,3), (4,2), (4,3)\}$
 - (a) $\{3,2\}$
 - (b) $\{1,4\}$
 - (c) $\{1,2,3,4\}$
 - (d) $\{3,4\}$
- ⑤ If the probability of team winning any match is 80% how many matches is the team expected to win out of a total of 35 matches?
 - (a) 7
 - (b) 14
 - (c) 21
 - (d) 28
- ⑥ In the given figure: what is the slope of the line l
 - (a) $\frac{5}{3}$
 - (b) $\frac{3}{5}$
 - (c) $-\frac{5}{3}$
 - (d) $-\frac{3}{5}$

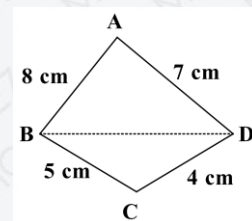


- ⑦ If: $(x^3, y + 1) = (27, \sqrt[3]{27})$, what is the value of $x+y$?
 - (a) 5
 - (b) 4
 - (c) 3
 - (d) 2
- ⑧ What is the radius of a circle with a circumference of 13π cm
 - (a) $\frac{\pi}{2}$ cm
 - (b) 6.5 cm
 - (c) 13 cm
 - (d) 26 cm
- ⑨ If $x = \{2\}$ and $n(y) = 2$, then: $n(x, y) =$
 - (a) 1
 - (b) 2
 - (c) 4
 - (d) 8

Question 2 : Answer the following questions :

- ① In the given figure :
Prove that: $m(\angle ABC) > m(\angle ADC)$

Draw $\overline{BD}$
Proof:



In the triangle ABD

$$\therefore AD > AB$$

$$\therefore m(\angle DBA) > m(\angle ADB) \rightarrow \textcircled{1}$$

In the triangle BCD

$$\therefore CD > BC$$

$$\therefore m(\angle DBC) > m(\angle BDC) \rightarrow \textcircled{2}$$

By adding $\textcircled{1}$ and $\textcircled{2}$

$$\therefore m(\angle ABC) > m(\angle ADC)$$

② If $\frac{x}{2} = \frac{y}{4} = \frac{z}{5}$, $x + y - 2z = 12$
Find the value of z

$$\frac{x + y - 2z}{2 + 4 - 10} = \frac{12}{-4} = -3 \text{ equal any prop.}$$

$$\therefore \frac{z}{5} = -3 \quad \therefore z = -15$$

③ If $A = \{1,7,9\}$, $B = \{2,4,7\}$, $C = \{1,7\}$ find:

a) $A \times C$ and represent it by arrow diagram

b) $B \times (A \cup C)$

a) $A \times C = \{(1,1), (1,7), (7,1), (7,7), (9,1), (9,7)\}$

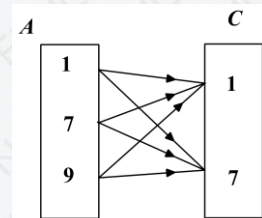
b) $B \times (A \cup C)$

$$A \cup C = \{1,7,9\}$$

$$\therefore B \times (A \cup C)$$

$$\{2,4,7\} \times \{1,7,9\}$$

$$= \{(2,1), (2,7), (2,9), (4,1), (4,7), (4,9), (7,1), (7,7), (7,9)\}$$



④ Represent graphically the function f which

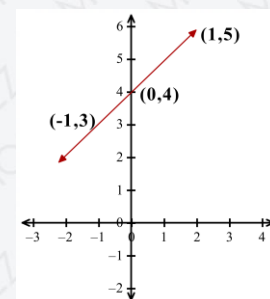
$$F(x) = x + 4$$

X	0	-1	1
Y	4	3	5

$$F(0) = 0 + 4 = 4$$

$$F(-1) = -1 + 4 = 3$$

$$F(1) = 1 + 4 = 5$$



5

In the opposite figure:-

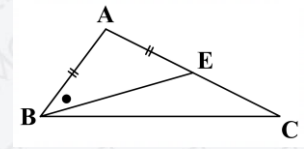
$C \in \overline{AE}$ $\overline{AB} = \overline{AE}$, Prove: $m(\angle ABE) > m(\angle C)$

Proof:- $\because \overline{AB} = \overline{AE}$

$$\therefore m(\angle ABE) = m(\angle AEB)$$

$$\therefore \overline{AC} > \overline{AB}$$

$$\therefore m(\angle ABE) > m(\angle C)$$



6

If a,b,c,d is a continued proportion : Prove that: $\frac{c^2 - d^2}{a - c} = \frac{bd}{a}$

$$\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = k$$

$$\therefore c = dk \quad b = dk^2 \quad a = dk^3$$

$$\therefore \frac{c^2 - d^2}{a - c} = \frac{d^2 k^2 - d^2}{dk^3 - dk} = \frac{d^2(k^2 - 1)}{dK(k^2 - 1)} = \frac{d}{k} \rightarrow \textcircled{1}$$

$$\therefore \frac{bd}{a} = \frac{dk^2 \times d}{dk^3} = \frac{d}{k} \rightarrow \textcircled{2}$$

From $\textcircled{1}$ and $\textcircled{2}$

$$\therefore \frac{c^2 - d^2}{a - c} = \frac{bd}{a}$$

7

If a person shoots an arrow at this board and hit it:-

1) Find the probability of hitting the colored region

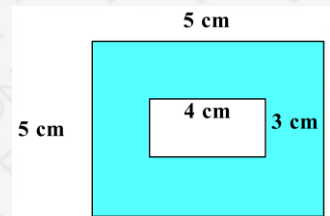
2) If 75 people each throw one arrow, what is

the expected number of times the shaded area will be hit

$$1) \text{ area of colored part} = 25 - 12 = 13$$

$\therefore$ probability of hitting the colored region.

$$2) \text{ the expected number} = \frac{13}{25} \times 75 = 39 \text{ times}$$



Question 1 : Choose the correct answer :

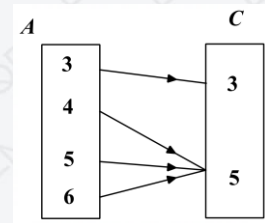
- 1 The mean proportion of the numbers 48 and 3 is
 (a) ± 6 (b) ± 12 (c) ± 144 (d) ± 1
- 2 One of the methods of data collection..
 (a) Mass population (b) Primary (c) historical (d) Secondly
- 3 Which of the following numbers are proportional?
 (a) 2.6.4 (b) 8.5.3 (c) 3.9.27 (d) 4.9.1
- 4 If ABC is a triangle where $m(\angle B) = 30^\circ, m \angle A = 100$ then
 (a) $AB < BC$ (b) $AB > BC$ (c) $AC > AB$ (d) $AC = BC$
- 5 The slope of the line perpendicular to the x-axis
 (a) 0 (b) 1 (c) Undefined (d) -1
- 6 If the probability of scoring a goal from a penalty in a handball match is 60% , what is the expected number of goals to be scored when 30 penalties are taken
 (a) 9 (b) 12 (c) 18 (d) 30
- 7 In the opposite figure: AD= cm
 (a) 12 (b) 144 (c) 24 (d) 36
- 8 The distance of the point A(-7,24) from the origin equals units
 (a) 12 (b) 25 (c) 15 (d) 20
- 9 The opposite figure represents a function on x then the range=.....
 (a) {a, b, c} (b) {a, b} (c) {b, c} (d) {a}

Question 2 : Answer the following questions :

- ① If f is a function on x where $x = \{3, 4, 5, 6\}$
 $F(6) = 5, F(5) = 5, F(4) = 5, F(3) = 3$
 Represent of by an arrow diagram, and write
 the relation R as a set of ordered pairs then find its range.

$$R = \{(3, 3), (4, 5), (5, 5), (6, 5)\}$$

$$\text{Range} = \{3, 5\}$$



- ② If $f(x) = 5x + b$, $f(2) = 12$
 Find the value of $b^2 - 2b - 10$

$$F(2) = 5(2) + b = 12$$

$$\therefore 10 + b = 12$$

$$\therefore b = 12 - 10$$

$$b = 2$$

$$b^2 - 2b - 10$$

$$(2)^2 - 2(2) - 10$$

$$4 - 4 - 10 = -10$$

$$\therefore b^2 - 2b - 10 = -10$$

- ③ In the opposite figure ABC is a right - angled triangle at A
 BDC is a right - angled at D

$$\overline{AE} \perp \overline{BC}$$

Find BC, AC, AE

In $\triangle BDC$

$$(BC)^2 = (BD)^2 + (DC)^2$$

$$= (7)^2 + (24)^2$$

$$= 49 + 576$$

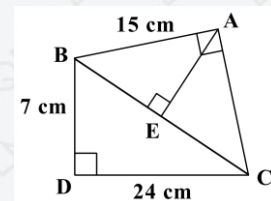
$$BC^2 = 625 \text{ cm}^2$$

$$\therefore BC = 25 \text{ cm}$$

in $\triangle ABC$

$$(AC)^2 = (BC)^2 - (AB)^2$$

$$= (25)^2 - (15)^2$$



$$AC^2 = 400 \text{ cm}^2$$

$$\therefore AC = 20 \text{ cm}$$

In $\triangle ABC$

$$\overline{AE} = \frac{AC \times AB}{BC}$$

$$\overline{AE} = \frac{20 \times 15}{25}$$

$$\therefore \overline{AE} = 12 \text{ cm}$$

4 If A (3,1), B (-5,1), C (-1,4) prove that the points A,B,C are not collinear .

$$AB \rightarrow m_1 = \frac{1-1}{-5-3} = \frac{0}{-8} = 0$$

$$AC \rightarrow m_2 = \frac{4-1}{-1-3} = \frac{-3}{4}$$

$$\therefore m_1 \neq m_2$$

$\therefore A, B, C$ are not collinear

5 Find the area of the circle whose center is the point M(-3,2) and passes through the point A(3,-6)

$$\text{area} = \pi r^2 \quad \overline{MA} = \text{radius} .$$

$$\overline{MA} = \sqrt{(3+3)^2 + (-6-2)^2}$$

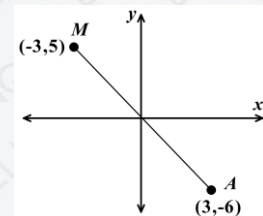
$$= \sqrt{6^2 + 8^2}$$

$$\sqrt{36 + 64}$$

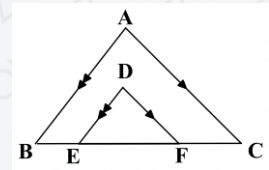
$$= \sqrt{100} = 10$$

$$\therefore \text{area} = \pi (10)^2$$

$$\text{area} = 100\pi \text{ cm}^2$$

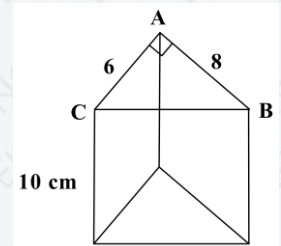


6 In the given figure : If $AC < AB$, Prove that : $\overline{DE} > \overline{DF}$



$\therefore AC < AB$
 $\therefore m(\angle B) < m(\angle C)$
 $\therefore \overline{AC} // \overline{DF}$
 $\therefore M(\angle DFE) = m(\angle C)$
 $\therefore \overline{AB} // \overline{DE}$
 $\therefore M(\angle B) = m(\angle DEF)$ from 1) and 2)
 $\therefore M(\angle DEF) < m(\angle DFE)$
 $\therefore \overline{DE} > \overline{DF}$

7 In the figure: a right triangle of prism with a height 10 cm and a base that is a right triangle , with the lengths of the legs being 6 cm , 8 cm .



Find the lateral area of the prism.

$L.A = \text{base perimeter} \times h$
 $BC^2 = AB^2 + AC^2 = 8^2 + 6^2 = 100 \text{ cm}^2$
 $\therefore BC = 10 \text{ cm}$
 $\text{Base perimeter} = 6 + 8 + 10 = 24 \text{ cm}$
 $\therefore L.A = 24 \times 10 = 240 \text{ cm}^2$

Model (3)

Question 1 : Choose the correct answer :

- 1 One of the secondary sources of data collection is:
- (a) Personal interview. (b) Questionnaire
- (c) Observation and measurement (d) **Internet**
- 2 The base of a right prism in the shape of a square with side length 5 cm, and its height is 6 cm , what is its lateral area ?
- (a) 30 cm^2 (b) **120 cm^2** (c) 150 cm^2 (d) 170 cm^2
- 3 If : $\frac{a}{b} = \frac{2}{7}$ what is the value of $\frac{2b}{7a}$?
- (a) $\frac{4}{49}$ (b) $\frac{2}{7}$ (c) **1** (d) $\frac{49}{4}$
- 4 If : $x = \{2,3\}$, $n(X \times y) = 6$, then : $n(y^2) =$
- (a) 3 (b) 4 (c) **9** (d) 16

- 5 A factory produces 800 bulbs daily and if the probability of a bulb being defective is 0.03 , what is the expected numbers of working bulbs produced per day ?
 (a) 24 bulb (b) 124 bulb (c) 560 bulb (d) **776 bulb**
- 6 Which of the following relations is not a function from
- (a)
- (b)
- (c)
- (d)
- 7 If the straight line representing the function f where: $f(x) = (ax-5)$ passes through the point $(2,3)$, what is the value of a ?
 (a) 8 (b) 6 (c) **4** (d) 1
- 8 What is the solution set of the inequality : $3x + 7 \leq 10$ in $\mathbb{R}$?
 (a) $[1. \infty[$ (b) $]0. \infty[$ (c) **$] - \infty. 1]$** (d) $] - \infty. 0[$
- 9 If : $f(x) = 4 - x$ what is the value of : $f(-4)$?
 (a) -8 (b) 0 (c) 4 (d) **8**

Question 2 : Answer the following questions :

- 1 If $A(0,6)$, $B(6,0)$, $C(2,-4)$, $D(-4,2)$ prove that the points A, B, C, D are the vertices of a rectangle.

$$\overline{AB} = \sqrt{(6-0)^2 + (0-6)^2} = \sqrt{36+36} = \sqrt{72}$$

$$\overline{CD} = \sqrt{(-4-2)^2 + (2+4)^2} = \sqrt{36+36} = \sqrt{72}$$

$$\overline{AD} = \sqrt{(-4-0)^2 + (2-6)^2} = \sqrt{16+16} = \sqrt{32}$$

$$\overline{BC} = \sqrt{(2-6)^2 + (-4-0)^2} = \sqrt{16+16} = \sqrt{32}$$

$$\therefore \overline{AB} = \overline{CD} , \overline{AD} = \overline{BC}$$

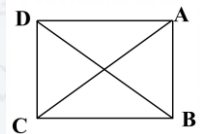
$$\overline{AC} = \sqrt{(2-0)^2 + (-4-6)^2} = \sqrt{4+100} = \sqrt{104}$$

$$\overline{BD} = \sqrt{(-4-6)^2 + (2-0)^2} = \sqrt{100+4} = \sqrt{104}$$

$$\therefore \overline{AC} = \overline{BD}$$

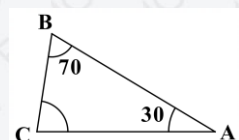
$$\therefore \overline{AC}, \overline{BD} \text{ are diagonals}$$

$$\therefore ABCD \text{ is a rectangle.}$$



- 2 ABC is a triangle in which $m(\angle A) : 30^\circ$, $m(\angle B) = 70^\circ$
 arrange the side lengths of a triangle in a descending order

$$\begin{aligned} M(\angle C) &= 180 - (30 + 70) \\ &= 180 - 100 \\ &= 80^\circ \end{aligned}$$



$$\overline{BC} < \overline{BC} < \overline{BA}$$

$$\overline{AB} \rightarrow \overline{AC} \rightarrow \overline{BC}$$

- 3 If $f(x) = 2x + K$, the point $(3, 11)$ lies on the straight line which represent the function f .

Find the value of $f(2)$, K

$$F(2) = 2(2) + K \rightarrow f(2) = 4 + K$$

$$F(3) = 2(3) + K = 11$$

$$\therefore 6 + K = 11$$

$$\therefore K = 11 - 6$$

$$\therefore k = 5$$

$$F(2) = 4 + 5 = 9$$

- 4 If $a : b : c = 2 : 3 : 4$ and $a^2 + b^2 + c^2 = 725$

Find the value of $b + a - c$

$$\frac{a}{b} = \frac{2}{3} = k \therefore a = 2k \quad b = 3k$$

$$\frac{b}{c} = \frac{3}{4} = k \therefore b = 3k \quad c = 4k$$

$$\therefore a^2 + b^2 + c^2 = 725$$

$$(2k)^2 + (3k)^2 + (4k)^2 = 725$$

$$4k^2 + 9k^2 + 16k^2 = 725$$

$$\therefore 29k^2 = 725$$

$$k^2 = 25$$

$$K = \pm 5$$

$$\text{at } k = 5$$

$$\therefore a = 2 \times 5 = 10, b = 3 \times 5 = 15, c = 4 \times 5 = 20$$

$$ak = -5$$

$$\therefore a = 2 \times (-5) = -10, b = 3 \times (-5) = -15, c = 4 \times (-5) = -20$$

$$\text{at } k = 5$$

$$\therefore b + a - c$$

$$15 + 10 - 20 = 25 - 20 = 5$$

$$\text{at } k = -5$$

$$\therefore b + a - c$$

$$-15 - 10 + 20 = -25 + 20 = -5$$

5

A random sample of 25 students was selected from a school among the students who participated in the mathematics competition, and the students were distributed as shown in the following table:

	First	Second	Total
Male student	8	7	15
Female student	6	4	10
Total	14	11	25

The winner could be a male student or from the first grade

$$= \frac{15 + 14 - 8}{25} = \frac{21}{25}$$

The probability that the winner is from the female student of the second grade

$$= \frac{4}{25}$$

Therefore, the expected number of female student in the second grade:

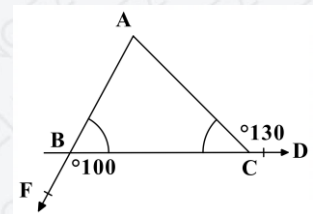
$$= \frac{4}{25} \times 1550 \\ = 248 \text{ female student}$$

6

ABC is a triangle in which $D \in \overrightarrow{BC}, F \in \overrightarrow{AB}$

$$M(\angle ACD) = 130^\circ, m(\angle FBC) = 100^\circ$$

Prove that $AC > AB$



$$M(\angle ACB) = 180^\circ - 130^\circ$$

$$M(\angle ACB) = 50^\circ$$

$$M(\angle ABC) = 180^\circ - 100^\circ$$

$$M(\angle ABC) = 80^\circ$$

$$\therefore m(\angle ABC) \geq m(\angle ACB)$$

$$\therefore \overline{AC} > \overline{AB}$$

7 If $x : y = 2 : 5$, find the value of $(10x + 3y) : (5x + 2y)$

$$\frac{x}{y} = \frac{2}{5} \quad \therefore \frac{x}{2} = \frac{y}{5} = k$$

$$\therefore x = 2k \quad y = 5k$$

$$\therefore \frac{10x + 3y}{5x + 2y} = \frac{10(2k) + 3(5k)}{5(2k) + 2(5k)}$$

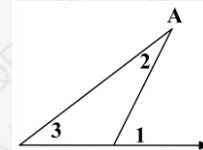
$$= \frac{20k + 15k}{10k + 10k}$$

$$= \frac{35k}{20k} = \frac{7}{4}$$

Model (4)

Question 1 : Choose the correct answer :

1 In the opposite figure
If $m(\angle 3) < m(\angle 2)$, which of the following is correct?



(a) $m(\angle 3) < m(\angle 2) < m(\angle 1)$

(b) $m(\angle 1) < m(\angle 3) < m(\angle 2)$

(c) $m(\angle 3) < m(\angle 1) < m(\angle 2)$

(d) $m(\angle 2) < m(\angle 3) < m(\angle 1)$

2 If $f: R \rightarrow R$ and $f(x) = 3$ then $f(6)$?

(a) 3

(b) 6

(c) 9

(d) 21

3 If the probability of football team winning is 0.8 how many matches are expected to won out of 30 matches?

(a) 15

(b) 18

(c) 24

(d) 27

4 What is the solution set of $\sqrt{2}x + 1 = 3$ in R

(a) $\{2\}$

(b) $\{1\}$

(c) $\emptyset$

(d) $\{\sqrt{2}\}$

- 5 The straight line that represent the function f which $f(x) = 2 \times -6$, cut x – axis in the point
 (a) (0,3) (b) (0,6) (c) (6,0) (d) (3,0)
- 6 If $(x^5, y + 1) = (243, \sqrt[3]{64})$, then $x - y =$
 (a) 5 (b) 2 (c) 4 (d) 0
- 7 Data collection sources are divided into primary sources and sources
 (a) Samples (b) Stratified (c) Historical (d) Secondary
- 8 If $\frac{a}{c+a+b} = \frac{b}{a+b-c} = \frac{c}{b+c-a}$ then each ratio equals
 (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) 1
- 9 If the slope of the straight line passing through the two points $A(a + 2, 3), B(-a, -9)$
 (a) -2 (b) 0 (c) 2 (d) 4

Question 2 : Answer the following questions :

- 1 What number, when added to each of the numbers 3,8,18 makes then proportional?

Assuming the number is x

$$3+x, 8+x, 18+x$$

$$\frac{3+x}{8+x} = \frac{8+x}{18+x}$$

$$(3+x)(18+x) = (8+x)^2$$

$$\therefore 54 + 21x + x^2 = 64 + 16x + x^2$$

$$\therefore 5x = 10$$

$$\therefore x = 2$$

- 2 In the given figure : Find the total area.

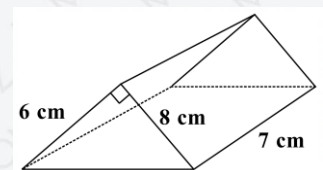
$$\text{Base area of the prism} = \frac{1}{2} \times 6 \times 8 = 24 \text{ cm}^2$$

$$\text{The length of hypotenuse} = \sqrt{6^2 + 8^2} = \sqrt{100} = 10 \text{ cm}$$

$$\text{The perimeter of the base of prism} = 6 + 8 + 10 = 24 \text{ cm}$$

$$\text{The lateral area of the prism} = 24 \times 7 = 168 \text{ cm}^2$$

$$\text{The total area} = 168 + 24 + 24 = 216 \text{ cm}^2$$



3

Find the area of the figure: ($\pi = \frac{22}{7}$)

Area of trapezium $b_1 = 12 \text{ cm}$ $b_2 = 18 \text{ cm}$

$$A = \frac{1}{2}(b_1 + b_2)h$$

$$A = \frac{1}{2}(18 + 12) \times 5$$

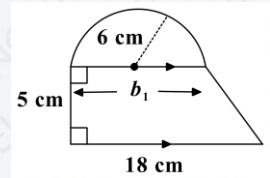
$$A = \frac{1}{2} \times 30 \times 5$$

$$\therefore A = 75 \text{ cm}^2$$

$$\text{Area of, circle} = \frac{1}{2}\pi r^2 = \frac{1}{2} \times \frac{22}{7} \times (6)^2 = 56\frac{4}{7} \text{ cm}^2$$

Half

$$\therefore \text{area of shape} = 56\frac{4}{7} + 75 = 131\frac{4}{7} \text{ cm}^2$$



4

Find the S.S of the following inequality in R and represent it on the number line
 $5 - 3x \geq 2$

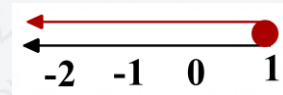
$$5 - 3x \geq 2$$

$$-3x \geq 2 - 5$$

$$-3x \geq -3$$

$$x \leq 1$$

$$\therefore \text{S.S} =]-\infty, 1]$$



5

If b is the mean proportional between a and c

$$\text{Prove that } \frac{a-c}{a+b} = \frac{a-2b+c}{a-b}$$

$$\frac{a}{b} = \frac{b}{c} = k$$

$$a = ck^2$$

$$b = ck$$

$$\therefore \frac{a-c}{a+b} = \frac{ck^2 - c}{ck^2 + ck} = \frac{c(k^2 - 1)}{ck(k+1)} = \frac{k^2 - 1}{k(k+1)}$$

$$\therefore \frac{(k-1)(k+1)}{k(k+1)} = \frac{k-1}{k}$$

$$\frac{a-2b+c}{a-b} = \frac{ck^2 - 2ck + c}{ck^2 - ck} = \frac{c(k^2 - 2k + 1)}{ck(k-1)}$$

$$\frac{c(k-1)^2}{ck(k-1)} = \frac{(k-1)}{k}$$

$$\therefore \frac{a-c}{a+b} = \frac{a-2b+c}{a-b}$$

6 using the opposite venn diagram find

a) $(A \cap C) \times B$

b) $(C \cup B) \times A$

c) $(A \cap B) \times C$

a) $A \cap C = \{3\}$

$(A \cap C) \times B = \{(3,5), (3,6), (3,8)\}$

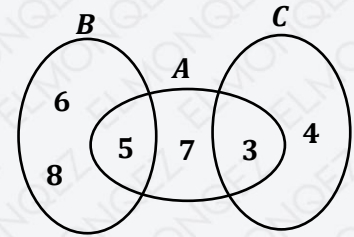
b) $(C \cup B) \times A = \{3,4,5,6,8\} \times \{5,7,3\}$

$= \{(3,5), (3,7), (3,3), (4,5), (4,7), (4,3), (5,5), (5,7), (5,3)\}$

$, (6,5,6,7), (6,3), (8,5), (8,7), (8,3)\}$

c) $A \cap B = \{5\}$

$(A \cap B) \times C = \{5\} \times \{3,4\} = \{(5,3), (5,4)\}$

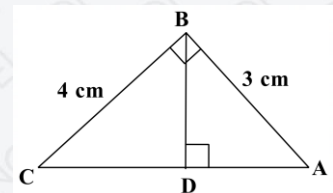


7 In the given figure : Find the length of the projection of $\overrightarrow{BC}$ on $\overrightarrow{AC}$

Projection of $\overrightarrow{BC}$ on $\overrightarrow{AC}$ is $\overrightarrow{CD}$

In ΔABC

$AC^2 = AB^2 + BC^2 = 3^2 + 4^2 = 9 + 16 = 25$



$$\therefore \overline{AC} = 5 \text{ cm}$$

$$CB^2 = \overline{CD} \times \overline{CA}$$

$$16 = CD \times 5$$

$$\therefore CD = \frac{16}{5} = 3\frac{1}{5} \text{ cm}$$

Model (5)

Question 1 : Choose the correct answer :

- 1 If: $f(x) = 5$, then: $3f(-5) = \dots\dots\dots$
 - (a) 15
 - (b) -2
 - (c) -15
 - (d) -25
- 2 What is the slope of line passing through the points A(3,2), B(4,2)?
 - (a) 2
 - (b) 1
 - (c) 0
 - (d) undefined
- 3 The sample method is suitable for all of the following except
 - (a) check the factory's production
 - (b) check the desert sands
 - (c) know the population
 - (d) patient's blood test
- 4 If $R = \{(1,3), (2,5), (4,3)\}$ is a function then the domain is
 - (a) {1,2,4}
 - (b) {3,4,5}
 - (c) N
 - (d)
- 5 In the opposite figure A, D, E and C lies on the same straight line and $EC < AD$. Then $AE \dots\dots DC$.

 - (a) >
 - (b) <
 - (c) =
 - (d) ≥
- 6 The range of the relation represented by the given arrow diagram:

x
1
2
3

y
4
5
6

 - (a) {1,2,3}
 - (b) {4,5,6}
 - (c) {4,5}
 - (d) {1,2,3,4,5}
- 7 Two Circles have areas 49π and 64π square units. What is the ratio of their circumference?
 - (a) 4:7
 - (b) 1:2
 - (c) 16:9
 - (d) 7:8

8

In triangle ABC, If $AB = 5$ cm, $BC = 7$ cm, $CA = 8$ cm then

(a)

$$m(\angle A) < m(\angle B)$$

(b)

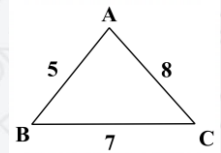
$$m(\angle A) > m(\angle B)$$

(c)

$$m(\angle A) = m(\angle B)$$

(d)

$$m(\angle C) > m(\angle B)$$



9

There are 320 workers and engineers in a factory, from which a random sample of 16 workers and engineers was selected. It was found that the number of engineers in the sample is 5. What is the expected number of engineers in the factory?

(a)

50 engineers

(b)

100 engineers

(c)

160 engineers

(d)

220 engineers

Question 2 : Answer the following questions :

1

If $\frac{a}{3} = \frac{b}{4} = \frac{c}{5} = \frac{4a+mb+5c}{25}$ find the value of m

$$\frac{a}{3} = k \rightarrow a = 3k, b = 4k, c = 5k$$

$$\frac{4(3k) + m(4k) + 5(5k)}{25} = k \rightarrow \frac{12k + 4mk + 25k}{25} = k$$

$$\frac{37k + 4mk}{25} = k \rightarrow k \neq 0 \rightarrow 37 + 4m = 25$$

$$4m = 25 - 37 \rightarrow 4m = -12 \rightarrow m = -3$$

2

If $(x - 4, 9) = (5, x + y)$ find the value of $\sqrt{4x + 2y}$

$$x - 4 = 5 \rightarrow x = 9$$

$$x + y = 9 \rightarrow 9 + y = 9 \rightarrow y = 0$$

$$\sqrt{4x + 2y} = \sqrt{4(9) + 2(0)} = \sqrt{36} = 6$$

3

Find the value of x if the number x, 24, 144 are proportional

$$\frac{x}{24} = \frac{24}{144} \rightarrow \frac{x}{24} = \frac{1}{6}$$

$$x = \frac{1 \times 24}{6} = \frac{24}{6} = 4$$

4

If $x = \{1, 3, 5\}$ and R is a function on x where: $R = \{(a, 3), (b, 1), (1, 5)\}$ find $(a + b)$

R function on x

$$x = \{1, 3, 5\}$$

$$3 \rightarrow a$$

$$5 \rightarrow b$$

$$a + b = 3 + 5 = 8$$



In the opposite figure:

ABC is a triangle its area 150 m^2 find AB, AD

$$\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$$

$$150 = \frac{1}{2} \times AB \times AC$$

$$150 = \frac{1}{2} \times AB \times 15$$

$$300 = AB \times 15$$

$$AB = 20 \text{ cm}$$

$$BC^2 = AB^2 + AC^2$$

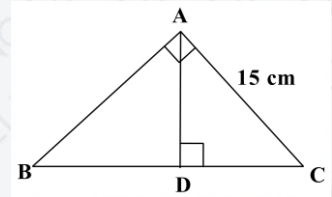
$$BC^2 = 20^2 + 15^2 \\ = 400 + 225 = 625$$

$$BC = \sqrt{625} = 25 \text{ cm}$$

$$\text{Area} = \frac{1}{2} \times b \times h$$

$$150 = \frac{1}{2} \times 25 \times AD$$

$$\therefore AD = \frac{300}{25} = 12 \text{ cm}$$



One of the car factories produces 3 models of cars in a year and its count is 500 cars of the first model, 700 of the second model, 300 of the third model. If the factory management wants to take a sample size of 105 cars from its total production represented in each model according to its production size, find the number of units of each model in the sample.

$$\text{Total number of Cars} = 300 + 700 + 500 = 1500 \text{ Cars}$$

$$\text{The Number of Cars of the first model in the sample} = \frac{500}{1500} \times 105 = 35 \text{ cars.}$$

The number of cars is 1500 second model.

$$\text{The Number of Cars of the second model in the sample} = \frac{700}{1500} \times 105 = 49 \text{ Cars.}$$

$$\text{The Number of Cars of the third model in the sample} = \frac{300}{1500} \times 105 = 21 \text{ Cars}$$



Prove that: the points $A(1,2), B(2,4), C(-3,-6)$ are collinear

Slope of AB (m_1)

$$m_1 = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 2}{2 - 1} = \frac{2}{1} = 2$$

Slope of BC (m_2)

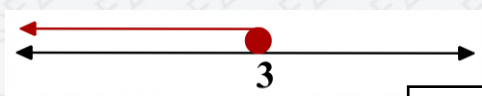
$$m_2 = \frac{-6 - 4}{-3 - 2} = \frac{-10}{-5} = 2$$

$m_1 = m_2 = 2$ and they share a common point (B)

$\therefore A, B, C$ are collinear

Model (6)

Question 1 : Choose the correct answer :

- 1 If x is the positive mean propetione between the numbers 54 and 24 , what is the value of x ?
 (a) 15 (b) 36 (c) 39 (d) 78
- 2 If $\frac{a}{b} = \frac{b}{c} = 2$ which of the following is correct ?
 (a) $a = 2c$ (b) $a = 4c$ (c) $a = 4b$ (d) $a = 2b$
- 3 A right pentagonal prism has a regular pentagon base whose area is 10 m^2 , and the area of one lateral rectangle is 9 m^2 , then the total surface area of the prism.
 (a) 19 m^2 (b) 38 m^2 (c) 55 m^2 (d) 65 m^2
- 4 $\{3\} \times \{5\} = \dots\dots$
 (a) $\{3,5\}$ (b) $\{(3,5)\}$ (c) $\{15\}$ (d) $(3,5)$
- 5 Which of the following represents the solution set in R in the given figure?

 (a) $x > 8$ (b) $x < 3$ (c) $x \geq 3$ (d) $x \leq 3$
- 6 If $3a = 5b = 4c$, then $a : b : c$ equal .
 (a) 20:12:15 (b) 9:12:16 (c) 15:10:9 (d) 8:5:3
- 7 If $\frac{b}{3} = \frac{9}{5}$ then $\frac{a-b}{a+b} =$
 (a) $\frac{2}{5}$ (b) $\frac{1}{4}$ (c) 4 (d) $\frac{5}{8}$
- 8 The ordered pair $(0, 3)$ belongs to the function F where:
 (a) $f(x) = 2x + 1$ (b) $f(x) = 3x - 1$
 (c) $f(x) = x + 3$ (d) $f(x) = 3x$

9

In the given figure :

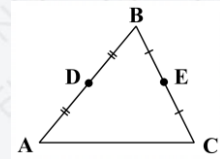
If $D(-1, -2)$, $E(2, 3)$ are the midpoints of $\overline{AB}$, $\overline{BC}$ respectively what is the length of $\overline{AC}$?

(a) $\sqrt{34}$

(b) $2\sqrt{34}$

(c) $2\sqrt{5}$

(d) $4\sqrt{5}$



Question 2 : Answer the following questions :

1

If $\frac{2x+3}{2x-3} = \frac{2y+5}{2y-5}$

Find the value of $x : y$

$$(2x + 3)(2y - 5) = (2y + 5)(2x - 3)$$

$$4xy - 10x + 6y - 15 = 4xy - 6y + 10x - 15$$

$$4xy - 10x + 6y - 15 - 4xy + 6y - 10x + 15 = 0$$

$$-10x + 6y - 6y - 10x = 0$$

$$-20x + 12y = 0 \quad 20x = 12y$$

$$\frac{x}{y} = \frac{12}{20}$$

$$\therefore \frac{x}{y} = \frac{3}{5}$$

2

Find the area of the circle whose center is $M(-3, 2)$ and which passes through the point $A(3, -6)$

$$r = \overline{MA} = \sqrt{(3 + 3)^2 + (-6 - 2)^2}$$

$$= \sqrt{6^2 + 8^2}$$

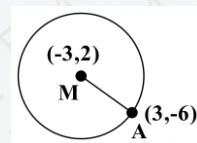
$$= \sqrt{100}$$

$$\therefore r = 10 \text{ units}$$

$$\text{area} = \pi r^2$$

$$= \pi(10)^2$$

$$\text{area} = 100\pi \text{ square units.}$$



3

If b is the middle proportional between a and c prove that: $\frac{a}{c} = \frac{4a^2 + 9b^2}{4b^2 - 9c^2}$

$$b^2 = ac$$

$$R.H.S = \frac{4a^2 - 9(ac)}{4ac - 9c^2} = \frac{a(4a - 9c)}{c(4a - 9c)} = \frac{a}{c} = L.H.S$$

- 4 A triangle with side length 9 cm, $(3x + 5)cm$, 20 cm
what are the possible value of x ?

Inequality triangle:

$$20 - 9 < 3x + 5 < 20 + 9$$

$$11 < 3x + 5 < 29$$

$$11 - 5 < 3x < 29 - 5$$

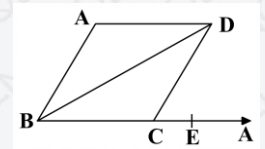
$$6 < 3x < 24$$

$$2 < x < 8$$

$$x =]2,8[$$

- 5 In the opposite figure:

ABCD is a parallelogram, $E \in \overrightarrow{AC}$ prove: $m(\angle DCE) > m(\angle ADB)$



ABCD is a parallelogram $AD \parallel BC$

so $m(\angle ADB) = m(\angle CBD)$ Alternate interior angles :

$\triangle BCD \rightarrow \angle DCE$ exterior angle to this Δ at vertex C

$$m(\angle DCE) > m(\angle CBD)$$

$$\therefore m(\angle DCE) > m(\angle ADB)$$

- 6 If the quantities 35, 15, 3, $2x + 1$ are proportional, find the numerical value of x

$$\frac{35}{15} = \frac{3}{2x + 1}$$

$$35(2x + 1) = 3 \times 15$$

$$2x = \frac{45}{35} - 1$$

$$= \frac{9}{7} - 1$$

$$2x = \frac{2}{7}$$

$$\therefore x = \frac{2}{7} \times \frac{1}{2}$$

$$x = \frac{1}{7}$$

- 7 A hospital has 100 doctors and 200 nurses a layer sample of 60 individuals was taken, representing each layer according to its size. calculate number of nurses

Doctors = 100 , Nurses = 200

Total population = 100 + 200 = 300

Total sample = 60

Number in sample = $\frac{\text{layer}}{\text{total population}} \times \text{total sample}$

Number of nurses = $\frac{200}{300} \times 60 = \frac{2}{3} \times 60 = 40 \text{ nurses}$

Model (7)

Question 1 : Choose the correct answer :

- 1 In the rhombus ABCD, the diagonals intersect at E, If $AC > BD$, then $BE \dots AE$
- (a) $>$ (b) $=$ (c) $<$ (d) $\geq$
- 2 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 5$ then the value of $\frac{a+b+c}{b+c+d}$ is
- (a) 15 (b) 5 (c) 25 (d) 1
- 3 If $x = \{1,3\}$, $y = \{2,8\}$ then $(1,1) \in \dots$
- (a) $x \times y$ (b) $y \times x$ (c) x^2 (d) y^2
- 4 If : $X \times Y = \{(2,3)\}$, then $X^2 =$
- (a) $\{(4,9)\}$ (b) $\{(4,3)\}$ (c) $\{(2,2)\}$ (d) $\{(2,9)\}$
- 5 If the slope of the line passing through the points (4, k) and (3, 2) equals 6 then the value of k ?
- (a) 4 (b) 6 (c) 8 (d) 10

- 6 The lateral surface area of right triangular prism whose base sides are 3 cm, 4cm, 5 cm and whose height is 8 cm =
- (a) 120 cm^2 (b) 108 cm^2 (c) 50 cm^2 (d) 96 cm^2
- 7 If $A(-4,1)$ and $B(1,13)$ then the length of $\overline{AB}$ equals Units
- (a) 20 (b) 13 (c) 25 (d) 10
- 8 Which of the following Cartesian product does the point $(\frac{1}{5}, \sqrt{5})$ belong to ?
- (a) $N \times N$ (b) $Z \times Z$ (c) $Q \times Q$ (d) $R \times R$
- 9 If: $n(x^2) = 9, n(x \times y) = 12$, then $n(y^2)$
- (a) 6 (b) 9 (c) 10 (d) 16

Question 2 : Answer the following questions :

- 1 If the following numbers are in proportional: 4,5, x , 20 find the value of x

$$\frac{4}{5} = \frac{x}{20} \rightarrow 5x = 4 \times 20 \rightarrow 5x = 80$$

$$x = \frac{80}{5} = 16$$

- 2 If a, b, c, d are in continued proportion prove that: $\frac{c^2 - d^2}{a - c} = \frac{bd}{a}$

$$\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = m$$

$$a = (dm)^2, b = dm^2, c = dm$$

$$L.H.S = \frac{(dm)^3 - d^2}{dm^3 - dm} = \frac{d^2m^2 - d^2}{d(m^3 - m)}$$

$$\frac{d^2(m^2 - 1)}{dm(m^2 - 1)} = \frac{d}{m}$$

$$R.H.S = \frac{bd}{a} = \frac{(dm)^2 d}{dm^3} = \frac{d^2m^2}{dm^3} = \frac{d}{m}$$

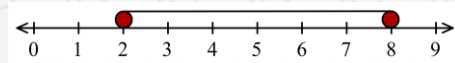
$$L.H.S = R.H.S$$

- 3 Find the solution set of the following Inequality in R and represent it on the number line $4x - 1 \leq 5x - 3 \leq 4x + 5$

$$4x - 1 \leq 5x - 3$$

$$3 - 1 \leq 5x - 4x$$

$$2 \leq x$$



$$5x - 3 \leq 4x + 5$$

$$5x - 4x \leq 5 + 3$$

$$x \leq 8$$

$$2 \leq x \leq 8$$

$$S.S = [2,8]$$



If $A = \{1,9,7\}$, $B = \{2,4,7\}$, $C = \{1,7\}$ find

1) $B \times (A - C)$

2) $(A \cap B) \times C$

1) $A - C = \{1,9,7\} - \{1,7\} = \{9\}$

$B \times (A - C) = \{2,4,7\} \times \{9\}$

$= \{(2,9), (4,9), (7,9)\}$

2) $(A \cap B) = \{1,9,7\} \cap \{2,4,7\} = \{7\}$

$(A \cap B) \times C = \{7\} \times \{(1,7)\} = \{(7,1), (7,7)\}$



If $\frac{a+b+c}{11} = \frac{a-b}{11} = \frac{a+b}{25}$ find the ratio $a : b : c$

$$\frac{a-b}{11} = k \rightarrow a-b = 11k$$

$$\frac{a+b}{25} = k \rightarrow a+b = 25k$$

$$(a-b) + (a+b) = 11k + 25k$$

$$2a = 36k \quad a = 18k$$

$$\frac{a+b+c}{11} = \frac{18k+7k+C}{11} = k$$

$$25k + C = K$$

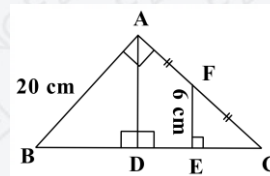
$$C = -14k$$

$$a:b:c = 18:7:-14$$

6

In the opposite figure : $m(\angle BAC) = 90^\circ$, $\overline{AD} \perp \overline{BC}$

$FA = FC$, $AB = 20 \text{ cm}$, $EF = 6 \text{ cm}$. Find : EC



In $\triangle ADC$

$$AF = FC$$

and $FE \parallel AD$

$$\therefore FE = \frac{1}{2} AD$$

In $\triangle ADB$

$$BD^2 = AB^2 - AD^2$$

$$= 20^2 - 12^2$$

$$= 400 - 144$$

$$BD^2 = 256$$

$$\therefore BD = 16 \text{ cm}$$

$$\therefore \overline{AD} = 2 \times 6 = 12 \text{ cm.}$$

$$AD^2 = BD \times DC$$

$$\therefore DC = \frac{AD^2}{BD}$$

$$DC = \frac{12^2}{16}$$

$$DC = 9 \text{ cm}$$

$\triangle ADC$

$$\therefore EC = \frac{1}{2} \times 9$$

$$DE = EC = \frac{1}{2} DC = 4.5 \text{ cm}$$

7

If $3x = 5y$ find the value of $\frac{7x+3y}{x+2y}$

$$3x = 5y \rightarrow x = \frac{5}{3}y$$

$$\frac{7x+3y}{x+2y} = \frac{7\left(\frac{5}{3}y\right)+3y}{\left(\frac{5}{3}y\right)+2y} = \frac{\frac{35}{3}y+3y}{\frac{5}{3}y+2y}$$

$$= \frac{\frac{35}{3}y + \frac{9}{3}y}{\frac{5}{3}y + \frac{6}{3}y} = \frac{\frac{44}{3}y}{\frac{11}{3}y} = \frac{44}{11} = 4$$

Model (8)

Question 1 : Choose the correct answer :

- 1 If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$ then $\frac{a+d}{d} =$

(a) 9 (b) 7 (c) 8 (d) 9
- 2 If $R = \{(1,3), (2,3), (4,3)\}$ represent a function then the domain =

(a) Z (b) N (c) {3} (d) {4,2,1}
- 3 If b is the mean proportional between $(3 + \sqrt{2})$, $(12 - \sqrt{32})$, what is the value of b ?

(a) $\pm\sqrt{7}$ (b) $\pm 2\sqrt{7}$ (c) $\pm 4\sqrt{7}$ (d) $\pm 16\sqrt{7}$
- 4 If $f: R \rightarrow R, f(x) = 3$ find the value of $f(6) + f(1)$

(a) 3 (b) 6 (c) 7 (d) 9
- 5 In the opposite figure A, B, D and C lie on the same straight line, and $CE < AD$ then $AE \dots DC$

(a) > (b) < (c) = (d) $\geq$
- 6 What is the slope of line passing through the points $A(5,4), B(-2,-3)$

(a) $\frac{4}{5}$ (b) $\frac{1}{3}$ (c) -1 (d) 1
- 7 The interval $[-1, 2[$ is the solution set in $\mathbb{R}$ for the inequality

(a) $-1 \leq x < 2$ (b) $-1 < x < 2$ (c) $-1 < x \leq 2$ (d) $-1 \leq x \leq 2$
- 8 If the school's media team consists of 24 members, including 6 teachers, 8 girls, and 10 boys, and a member is chosen at random to give a speech for the opening of the Grand Egyptian Museum, what is the probability that the member is a boy or a teacher?

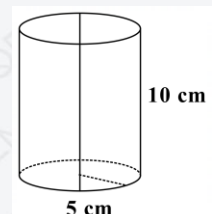
(a) $\frac{1}{4}$ (b) $\frac{2}{3}$ (c) $\frac{7}{12}$ (d) $\frac{1}{3}$
- 9 The circumference of a circle with a diameter of 20 cm =

(a) $20 \pi \text{ cm}$ (b) $10 \pi \text{ cm}$ (c) $20 \pi \text{ cm}^2$ (d) $40 \pi \text{ cm}^3$

Question 2 : Answer the following questions :

- 1 In the figure of a right cylinder with a radius of 5 cm and a height of 10 cm find the volume of the cylinder

$$V = \pi r^2 \times h$$



$$= \pi \times (5)^2 \times 10$$

$$V = 25 \times 10 \times \pi = 250 \pi \text{ cm}^3$$

- ② In the opposite figure $AB = 12 \text{ cm}$ $AC = 16 \text{ cm}$ find the area and circumference of circle M in term of π

$$\text{Circumference} = 2\pi r$$

$$(BC)^2 = (AB)^2 + (AC)^2$$

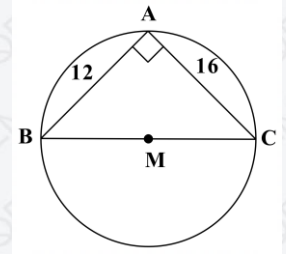
$$(BC)^2 = (16)^2 + (12)^2 = 256 + 144 = 400$$

$$(BC) = 20$$

$$r = 10$$

$$\therefore \text{circumference} = 2 \times 10\pi = 20 \pi \text{ cm}$$

$$\text{Area} = \pi r^2 = (10)^2 \pi = 100 \pi \text{ cm}^2$$



- ③ Find the third proportional for the quantities 12, 28, 35

$$\frac{12}{28} = \frac{x}{35}$$

$$x = \frac{12 \times 35}{28} = 15$$

$$\text{Third} = 15$$

- ④ In the opposite figure, find:

- 1) The length of $\overline{AB}$
- 2) The projection of $\overline{AC}$ on $\overline{BC}$
- 3) The projection of $\overline{AD}$ on $\overline{BC}$
- 4) The length of the projection of $\overline{AC}$ on $\overline{BC}$

① In $\triangle ABC$

$$AB^2 = BC^2 - AC^2$$

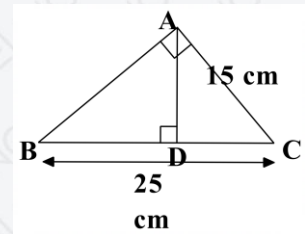
$$= (25)^2 - (15)^2$$

$$= 400$$

$$\therefore AB = 20 \text{ cm}$$

② Projection of $\overline{AC}$ on $\overline{BC}$ is $\overline{AD}$

$$\overline{AC} = \frac{\overline{AB} \times \overline{AC}}{\overline{BC}}$$



$$= \frac{20 \times 15}{25}$$

$$\therefore \overline{AD} = 12 \text{ cm}$$

③ Projection of $\overline{AB}$ on $\overline{BC}$ is point D

④ Projection of $\overline{AB}$ on $\overline{BC}$ is BD

$$AB^2 = \overline{BD} \times \overline{BC}$$

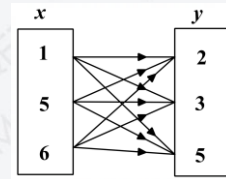
$$\therefore \overline{BD} = \frac{AB^2}{BC}$$

$$\therefore \overline{BD} = \frac{(20)^2}{25}$$

$$= \frac{400}{25}$$

$$\therefore \overline{BD} = 16 \text{ cm}$$

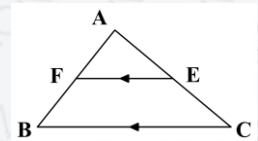
⑤ If $x = \{1,5,6\}$, $y = \{5,7\}$, $z = \{2,3,5\}$ find $(x \times z)$ and represent it by arrow diagram
 $\{(1,2), (1,3), (1,5), (5,2), (5,3), (5,5), (6,2), (6,3), (6,5)\}$



⑥ In the opposite figure:

$$\overline{BC} \parallel \overline{FE}, \overline{AC} > \overline{AB}$$

Prove that: $m(\angle AFE) > m(\angle AEF)$



$$\therefore \overline{BC} \parallel \overline{FE}$$

$$\therefore m(\angle AFE) = m(\angle ABC) \quad (1)$$

$$\text{and } m(\angle AFE) = m(\angle ACB) \quad (2)$$

$$\therefore \overline{AC} > \overline{AB}$$

$$\therefore m(\angle ABC) > m(\angle ACB)$$

From (1) and (2)

$$\therefore m(\angle AFE) > m(\angle AEF)$$

$$\therefore AC > AB$$

- 7 Find the solution set in R for the equation $12 + 4x = 2(3 + 3x)$

$$12 + 4x = 6 + 6x$$

$$6x - 4x = 12 - 6$$

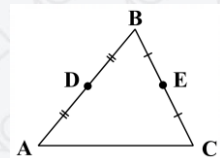
$$2x = 6$$

$$\therefore x = 3$$

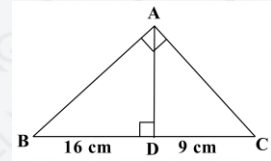
$$S.S = \{3\}$$

Model (9)

Question 1 : Choose the correct answer :

- 1 If a is the first proportional for the two numbers 6, 9 find the value of (a)
 - (a) 64
 - (b) 20
 - (c) 4
 - (d) 1
- 2 In the rhombus $ABCD$, the diagonals intersect at E if $AC > BD$, then BE
 - (a) $>$
 - (b) $<$
 - (c) $=$
 - (d) $\geq$
- 3 The linear function f where : $f(x) = 2x - 1$ is represented by a straight line that intersects the y-axis at the point:
 - (a) (0,1)
 - (b) (-1,0)
 - (c) (1,0)
 - (d) (0, -1)
- 4 In the given figure :
 $D(-1, -2), E(2, 3)$ are the midpoints of $\overline{AB}, \overline{BC}$ respectively
 Find the length of $\overline{AC}$

 - (a) $3\sqrt{34}$
 - (b) $2\sqrt{5}$
 - (c) $4\sqrt{5}$
 - (d) $2\sqrt{34}$
- 5 If : $x, y = \{(8, 5), (4, 7), (a, b), (a, 5)\}$ then : $x =$
 - (a) {7,9}
 - (b) {4,9}
 - (c) {4,7}
 - (d) {5,9}

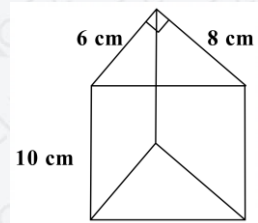
- 6 In the opposite figure $AD =$
- (a) **12** (b) 144
(c) 24 (d) 36



- 7 The volume of a right circular cylinder with a base radius of 5 cm and a height of 7 cm
- (a) $150\pi cm^3$ (b) $128\pi cm^3$ (c) **$175\pi cm^3$** (d) $40\pi cm^3$
- 8 A right circular cylinder with a base diameter of length 10 cm and a height of 15 cm. What is its volume?
- (a) $75\pi cm^3$ (b) $150\pi cm^3$ (c) $375\pi cm^3$ (d) **$1500\pi cm^3$**
- 9 Find the solution set of the inequality $3x \leq 21$ in R
- (a) $] -\infty, 7[$ (b) $]7, \infty[$ (c) $[7, \infty[$ (d) **$] -\infty, 7]$**

Question 2 : Answer the following questions :

- 1 A right triangular prism with a height of 10 cm and a base that is a right triangle with the length of the less being 6 cm, 8 cm find the lateral are of the prism



$$h = \sqrt{6^2 + 8^2} = 10 \text{ cm}$$

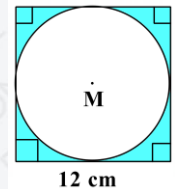
$$P = 6 + 8 + 10 = 24$$

$$L.A = 24 \times 10$$

$$L.A = \frac{1}{2}(b \times h) \times h \text{ prism}$$

$$L.A = 24 \times 10 = 240 \text{ cm}^2$$

- 2 Circle M touches the sides of squares ABCD from the inside where $AD = 12 \text{ cm}$ find the circumference and area of the shaded region ($\pi = 3.14$)



$$\text{Perimeter of square} = 48 \text{ cm}$$

$$12 \times 4 = 48 \text{ cm}$$

$$\text{Circumference of circle} = 2\pi r$$

$$2 \times 3.14 \times 6 = 37.68 \text{ cm}$$

$$\text{Circumference of shaded} = 85.68 \text{ cm}$$

$$\text{Area of square} = 12 \times 12 = 144 \text{ cm}^2$$

$$\text{Area of the circle} = \pi r^2 = 3.14 \times (6)^2 = 113.04 \text{ cm}^2$$

$$\text{Area of shaded} = 144 - 113.04 = 30.96 \text{ cm}^2$$

3

In the opposite figure:

Find all possible value of x

$$AB = DE \quad BC = DF$$

$$m(\angle B) > m(\angle D)$$

$$\therefore AC > EF$$

$$AC = 12 \text{ cm}$$

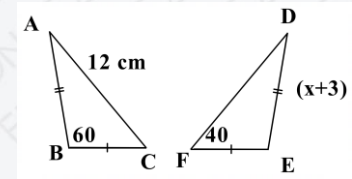
$$EF = (x + 3) \text{ cm}$$

$$x + 3 < 12 \quad x < 9$$

$$x + 3 > 0$$

$$x > -3$$

$$-3 < x < 9$$



4

ABCD is a rectangle its area is 48 cm^2 $DE \perp AC$, $AD = 6 \text{ cm}$ find CD, AC, ED

$$\text{Area} = 48 \text{ cm}^2$$

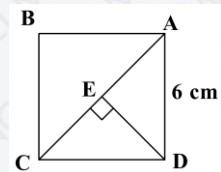
$$\text{Then } CD = 8 \text{ cm}$$

$$(AC)^2 = (AD)^2 + (CD)^2$$

$$(8)^2 + (6)^2 = 64 + 36 = 100$$

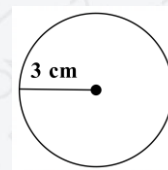
$$AC = 10 \text{ cm}$$

$$ED = \frac{6 \times 8}{10} = 4.8 \text{ cm}$$



5

Draw a circle N with a diameter of 6 m



6

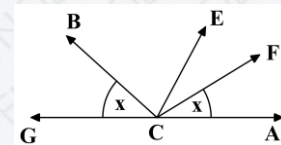
In the opposite figure :

$$m(\angle GCB) = m(\angle ACF), C \in \overline{GA} \text{ and}$$

$$m(\angle ECG) > m(\angle ECA)$$

prove that : $m(\angle ECB) > m(\angle ECF)$

$\therefore ACG$ is a straight line



$$\therefore m(\angle ECG) > m(\angle ACE)$$

$$(\angle ECG) = m(\angle GCB) + m(\angle BCE)$$

$$(\angle ECA) = m(\angle ECF) + m(\angle ACF)$$

$$m(\angle GCB) + m(\angle BCE) > m(\angle ECF) + m(\angle ACF)$$

$$\therefore m(\angle BCE) > m(\angle ECF)$$

7 In the opposite figure:

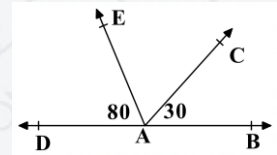
$\overrightarrow{DB}$, $m(\angle CAB) = 30^\circ$, $m(\angle EAD) = 80^\circ$ prove that $m(\angle DAC) > m(\angle BAE)$

$$\therefore A \in \overrightarrow{DB}, m(\angle CAB) < m(\angle EAD)$$

By adding $(\angle EAC)$ to both sides.

$$m(\angle CAB) + (\angle EAC) < m(\angle EAD) + (\angle EAC)$$

$$\therefore m(\angle DAC) > m(\angle BAE)$$



Model (10)

Question 1 : Choose the correct answer :

- 1 The length of projection of line segment a aparallel straight line to it the length of the original line segment
 (a) < (b) > (c) = (d) ≠
- 2 If $x = \{5, 7, 8\}$, $y = \{9, 10\}$ and R is a function from x to y where $R = \{(5, a), (8, 9)(k, a)\}$ What is the value k ?
 (a) 5 (b) 8 (c) 9 (d) 7
- 3 The slop of the straight line passing through the two points A (2, 3), (k, -6) is $-\frac{3}{2}$ what is the value of k ?
 (a) 2 (b) 4 (c) 6 (d) 8
- 4 The volume of a right circular cylinder is $320 \pi \text{ cm}^3$ and its height is 20 cm what is the length of it's base diameter
 (a) 2 cm (b) 4 cm (c) 8 cm (d) 16 cm

- 5 If $f: R \rightarrow R$ and $f(x) = 7$ what is the value of $\frac{5f(4)}{10f(6)}$?
 (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{7}{3}$ (d) $\frac{7}{2}$
- 6 If $5x - 2y = 0$ what is the value of $\frac{x}{y}$?
 (a) $-\frac{5}{2}$ (b) $-\frac{2}{5}$ (c) $\frac{5}{2}$ (d) $\frac{2}{5}$
- 7 What is the solution set of the inequality $5 > -x > -3$ is R ?
 (a) $[-5,3]$ (b) $] -5,3[$ (c) $[-3,5]$ (d) $] -3,5[$
- 8 The length of any side in a triangle The sum of the length of the other two sides
 (a) $>$ (b) $<$ (c) $=$ (d) Otherwise
- 9 A right circular cylinder has radius of base 5 cm and height 10 cm. Find its total surface area.
 (a) $150\pi cm^2$ (b) $200\pi cm^2$ (c) $300\pi cm^2$ (d) $600\pi cm^2$

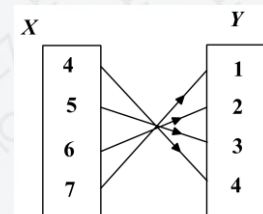
Question 2 : Answer the following questions :

- 1 A right circular cylinder has a base radius of 12 cm and a height of 22 cm. If the base radius increases by 25% while the height remains constant, calculate the volume of the cylinder after the increase.
 $r_1 = 12 \text{ cm}$ $h_1 = 22 \text{ cm}$
 $12 \times \frac{25}{100} = 3 \text{ cm}$
 $\therefore r_2 = 12 + 3 = 15 \text{ cm}$
 $V = \pi r^2 h$
 $V = \frac{22}{7} \times (15)^2 \times 22$
 $= 15543 \text{ cm}^3$
- 2 If $X = \{4,5,6,7\}$ and $Y = \{1,2,3,4\}$ and R is a relation from X to Y , where xRy means: $x + y = 8$ for every $x \in X, y \in Y$
 1) Write the relation as a set of ordered pairs.
 2) Represent the relation using an arrow diagram.
 3) State the domain and range of the relation.

1) $R = \{(4,4), (5,3), (6,2), (7,1)\}$

2)

$X + y = 8$



3) The domain: {4,5,6,7}

The range : {1,2,3,4}

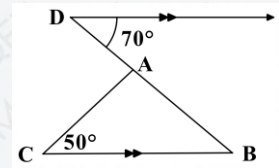
3 In the opposite figure, prove that: $AC > AB$

$$\therefore \overrightarrow{DE} // \overrightarrow{CB}$$

$$\therefore m(\angle EDB) > m(\angle ABC) = 70^\circ$$

$$\therefore m(\angle ABC) > m(\angle ACB)$$

$$\therefore \overline{AC} > \overline{AB}$$



4 If the slope of the straight line passing through two points $A(a + 2, 3)$ and $B(-a, -9)$ equal 2 find the value of a

$$\frac{-9 - 3}{-a - (a + 2)} = 2$$

$$\frac{-12}{-a - a - 2} = 2$$

$$\frac{-12}{-2a - 2} = 2 \rightarrow 2(-2a - 2) = -12$$

$$-4a - 4 = -12$$

$$-4a = -12 + 4 \rightarrow -4a = -8$$

$$a = 2$$

5 If b is the mean proportional between a and c , then prove that: $\frac{a^2}{b^2} + \frac{b^2}{c^2} = \frac{2a}{c}$

$$\frac{a}{b} = \frac{b}{c} = k$$

$$\therefore a = ck^2 \quad b = ck$$

$$\therefore \frac{a^2}{b^2} = \frac{(ck^2)^2}{(ck)^2} = \frac{c^2k^4}{c^2k^2} = k^2 \quad (1)$$

$$\frac{b^2}{c^2} = \frac{(ck)^2}{c^2} = k^2 \quad (2)$$

By adding (1) and (2):

$$k^2 + k^2 = 2k^2$$

$$\frac{2a}{c} = \frac{2(ck^2)}{c} = 2k^2$$

$$\therefore \frac{a^2}{b^2} = \frac{b^2}{c^2} = \frac{2a}{c}$$

6

A student conducted a survey on a sample of 25 students from his school to find out which sport they prefer to practice and recorded the results in the table below

Sport	Football	Basketball	Volleyball	Total
Number of students		4	2	25

If a student from the school is chosen randomly, find the probability that he prefers to play football. Then find the expected number of students who prefer to play football from the total of 600 students in the school.

The number of students who prefer to practice football:

$$= 25 - (2 + 4) = 19 \text{ students}$$

Therefore, the probability that the student prefers football:

$$= \frac{19}{25}$$

The expected number

$$= \frac{19}{25} \times 600 = 456 \text{ students}$$

7

In the opposite figure , find EF

$$\therefore AF = FC$$

$$AE = EB$$

$$\therefore \overline{EF} \parallel \overline{BC}$$

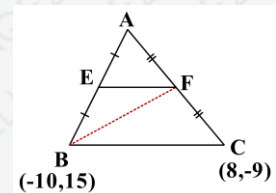
$$\text{and } EF = \frac{1}{2} BC$$

$$BC = \sqrt{(8 + 10)^2 + (-9 - 15)^2}$$

$$= \sqrt{900}$$

$$\therefore \overline{BC} = 30 \text{ cm}$$

$$\therefore \overline{EF} = \frac{1}{2} \times 30 = 15 \text{ cm}$$



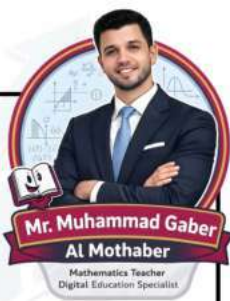
حمل الآن

مجانا وحصريا

امتحانات رقم (3)

الترم الثاني





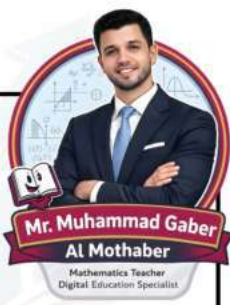
Question 1

Choose the correct answer

- 1 If : $X = \{5\}$, then : $n(X^2) = \text{-----}$
 - (a) 1
 - (b) 2
 - (c) 25
 - (d) 10
- 2 What is the radius of a circle with a circumference of 13π cm.?
 - (a) 6.5 cm.
 - (b) 13 cm.
 - (c) 26 cm.
 - (d) $\frac{\pi}{2}$ cm.
- 3 If : $5X - 3y = 0$ what is the value of $\frac{X}{y}$?
 - (a) $\frac{5}{3}$
 - (b) $\frac{3}{5}$
 - (c) $-\frac{5}{3}$
 - (d) $-\frac{3}{5}$
- 4 A factory produces 800 bulbs daily , and if the probability of a bulb being defective is 0.03 , what is the expected number of working bulbs produced per day ?
 - (a) 24 bulb.
 - (b) 124 bulb.
 - (c) 560 bulb.
 - (d) 776 bulb.
- 5 If : $R = \{ (2, 5), (3, 6) \}$ is a function , then the range = -----
 - (a) $\{2, 5\}$
 - (b) $\{3, 6\}$
 - (c) $\{5, 6\}$
 - (d) $\{2, 3\}$
- 6 If : A (0 , 4) , B (- 3 , 0) what is the length of $\overline{AB}$?
 - (a) 1 units of length.
 - (b) 3 units of length.
 - (c) 5 units of length.
 - (d) 7 units of length.
- 7 What is the slope of the line passing through the points A (3 , 2) and B (4 , 2) ?
 - (a) 0
 - (b) 1
 - (c) 2
 - (d) is undefined.
- 8 If : $(X^3, y + 1) = (27, \sqrt[3]{27})$, what is the value of $X + y$?
 - (a) 2
 - (b) 4
 - (c) 3
 - (d) 5



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9 If: $\frac{a}{b} = \frac{b}{c} = 3$, which of the following is correct ?

(a) $a = 3c$

(b) $a = 9b$

(c) $a = 9c$

(d) $a = 6c$

Question 2 Answer the following

1 A student conducted a survey on a sample of 25 students from his school to find out which sport they prefer to practice and recorded the results in the table below :

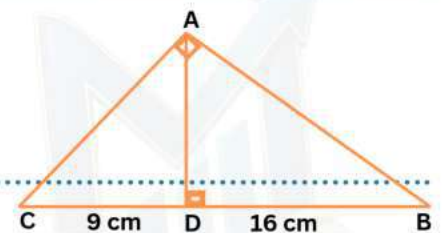
Sport	Football	Basketball	Volleyball	Total
Number of students		4	2	25

If a student from the school is chosen randomly, find the probability that he prefers to play football. Then find the expected number of students who prefer to play football from the total of 600 students in the school.

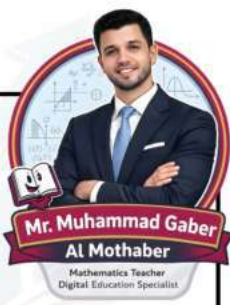
2 What number, when added to each of the numbers 3, 8, 18, makes them proportional ?

3 In the given figure :

Find the length of each of: $\overline{AB}$, $\overline{AC}$, $\overline{AD}$



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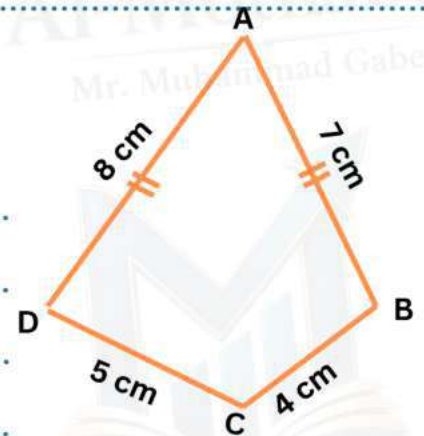
- 4 If : a, b, c, d are proportional quantities. Prove that :

$$\frac{a+b}{b} = \frac{c+d}{d}$$

- 5 If : $f(X) = 3X + b$ and the point $(4, 7)$ lies on the line representing the function f Find the value of each of : $b, f(1)$

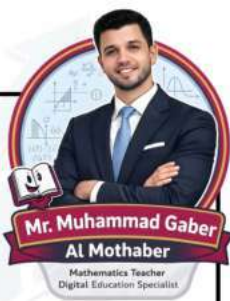
- 6 In the given figure :

Prove that : $m(\angle ABC) > m(\angle ADC)$



- 7 A right pentagonal prism made of metal with a base area of 105 cm^2 and a height of 11 cm is melted and formed into identical circular cylinders , each with a height of 2 cm. and a base radius of 3.5 cm.
Find the number of cylinders $(\pi \approx \frac{22}{7})$.

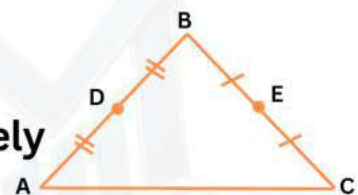
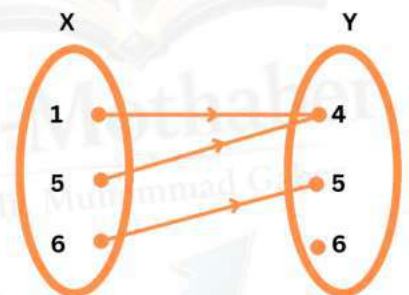




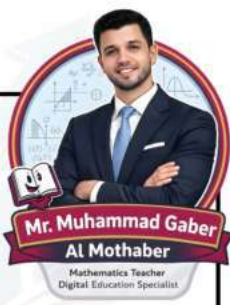
Question 1

Choose the correct answer

- 1 If: $\frac{a}{b} = \frac{c}{d} = \frac{2}{3}$, then: $\frac{a+c}{b+d} =$ -----
- (a) $\frac{4}{3}$ (b) $\frac{2}{3}$ (c) $\frac{4}{9}$ (d) $\frac{1}{3}$
- 2 A right circular cylinder with a base diameter of length 10 cm and a height of 15 cm What is its volume ?
- (a) $75\pi cm^3$ (b) $150\pi cm^3$ (c) $375\pi cm^3$ (d) $1500\pi cm^3$
- 3 What is the slope of the line passing through the points A(-2, 3), B(5, 7) ?
- (a) $\frac{4}{7}$ (b) $\frac{7}{4}$ (c) $\frac{4}{3}$ (d) $\frac{2}{3}$
- 4 Solution set of the inequality : $2X - 3 \leq 5X + 9$ in $\mathbb{R}$ is -----
- (a) $[4, \infty[$ (b) $[-4, \infty[$ (c) $] - \infty, 4[$ (d) $] - \infty, -4[$
- 5 Which of the following is a secondary source for data collection ?
- (a) questionnaires. (b) employee database.
(c) personal interview. (d) observation and measurement.
- 6 The range of the relation represented by the given arrow diagram is -----
- (a) {1,2,3} (b) {4,5}
(c) {1,2,3,4,5} (d) {4,5,6}
- 7 In the given figure :
If D(-1,-2), E(2,3) are the midpoints of $\overline{AB}$, $\overline{BC}$ respectively
What is the length of $\overline{AC}$?
- (a) $\sqrt{34}$ (b) $2\sqrt{34}$ (c) $2\sqrt{5}$ (d) $4\sqrt{5}$



Follow me



8 If $X = \{1, 2\}$, $Y = \{5, 6\}$, then : $(5, 1) \in$ -----

- (a) $Y \times X$ (b) X^2 (c) $X \times Y$ (d) Y^2

9 If : X is the positive mean proportional between the numbers 54 and 24 , what is the value of X ?

- (a) 15 (b) 36 (c) 78 (d) 39

Question 2

Answer the following

1 When taking a sample of 30 students from 750 students in one of the schools and asking them about their favorite activity and , their answers were as shown in the given table :

Activity	Frequency
Football	15
Swimming	8
Handball	4
Volleyball	3

If a student is randomly selected , then what is the probability that the student is one of the swimming activity favorites ?

and What is the expected number of students who prefer swimming activity in the school ?

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2 If : a, b, c, d in a continued proportion. Prove that : $\frac{c^2 - d^2}{a - c} = \frac{bd}{a}$

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3 If $X: y = 2 : 5$, find the value of $(10 X + 3 y) : (5 X + 2 y)$

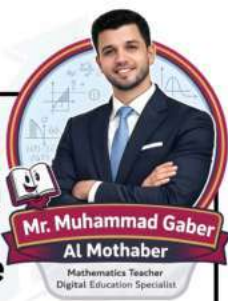
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- 4** An alloy in the shape of a right triangular prism with a right angled triangle base , with the lengths of the legs 9 cm and 12 cm and the height of the prism is 20 cm Melted and formed into cubes , each with an edge length of 3 cm Find the number of cubes.

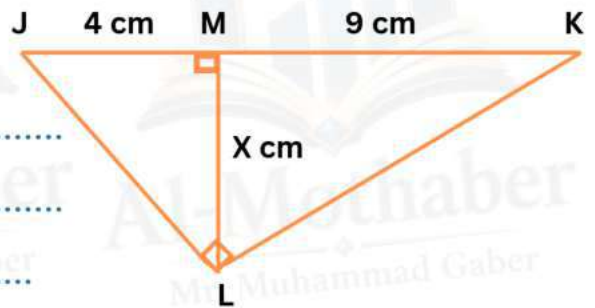
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- 5** In the given figure :
Find the value of : X

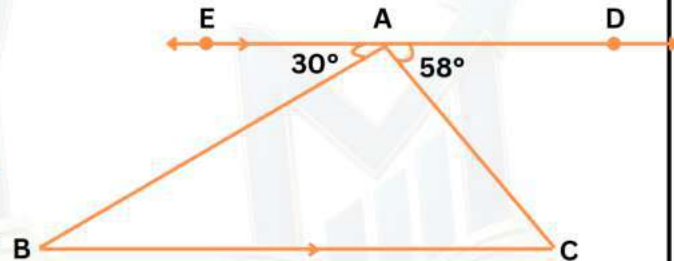


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- 6** In the given figure :
Prove that : $AB > AC$



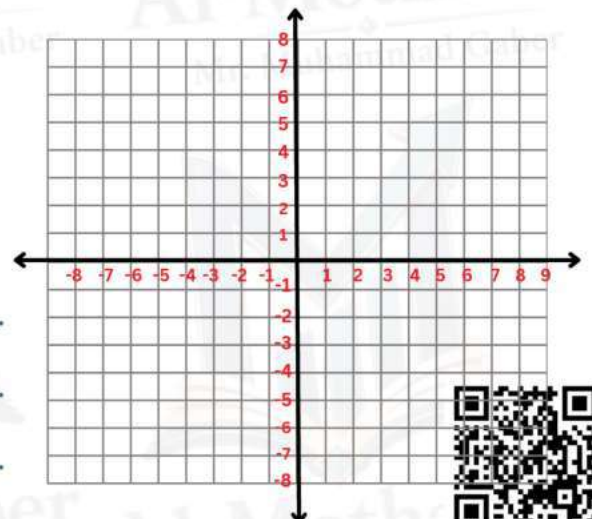
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- 7** Represent graphically the function f
where : $f(X) = 2X + 1$



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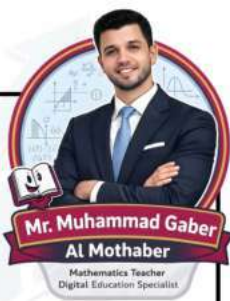
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Question 1 Choose the correct answer

1 If the school's media team consists of 18 members , 4 of them are teachers and 8 are students and one member of the team is randomly selected to give a speech , what is the probability that the selected member is a student or a teacher ?

a $\frac{4}{9}$

b $\frac{2}{9}$

c $\frac{2}{3}$

d $\frac{1}{3}$

2 What is the distance of point A(-3 , 4) from the origin ?

a 3 units of length.

b 5 units of length.

c 4 units of length.

d 7 units of length.

3 If : $X = \{2, 3\}$, $(X \times Y) = 6$, then : $n(Y^2) = \text{-----}$

a 9

b 4

c 3

d 16

4 What is the solution set of the inequality : $2X - 1 < 9$ in $\mathbb{R}$?

a $[5, \infty[$

b $]5, \infty[$

c $] - \infty, 5[$

d $] - \infty, 5[$

5 If : b is a mean proportional between 3 , 12 what is the value of b ?

a ± 4

b ± 6

c ± 9

d ± 36

6 In the given figure :

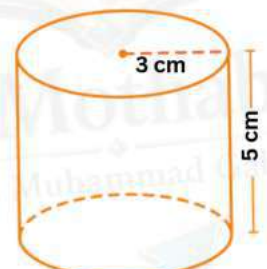
What is the surface area of the cylinder ? ($\pi \approx 3.14$)

a 301.44cm^2

b 70.65cm^2

c 150.72cm^2

d 141.3cm^2



7 In the given figure :

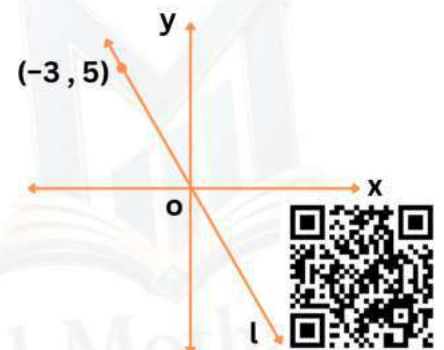
What is the slope of the line l ?

a $\frac{5}{3}$

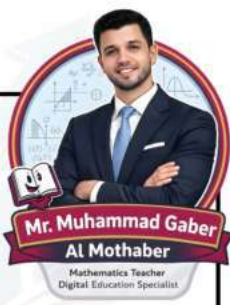
b $-\frac{5}{3}$

c $\frac{3}{5}$

d $-\frac{3}{5}$



Follow me



- 8 If : $f(X) = 5$, then : $3 f(- 5) =$ -----
- (a) - 2 (b) 15 (c) - 25 (d) - 15
- 9 If : $\frac{a}{b} = \frac{2}{7}$ what is the value of : $\frac{7b}{7a}$
- (a) $\frac{4}{49}$ (b) $\frac{2}{7}$ (c) $\frac{49}{14}$ (d) 1

Question 2

Answer the following

- 1 A classroom has 36 students , of whom 27 students passed in mathematics , 12 students passed in Arabic and 9 students passed in both exams. If a student is chosen randomly. Find the probability that the selected student passed in mathematics only. If the total number of students in the school is 540 , what is the expected number of students who will pass in mathematics only ?

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- 2 Find the value of X that makes 4 , 5 , X , 10 are proportional.

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- 3 In the given figure :

Prove that : $BC > AC$

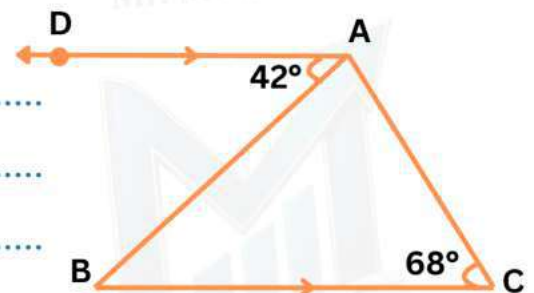
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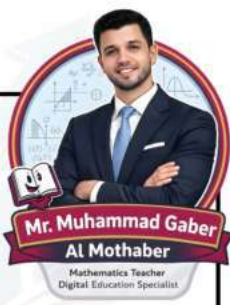
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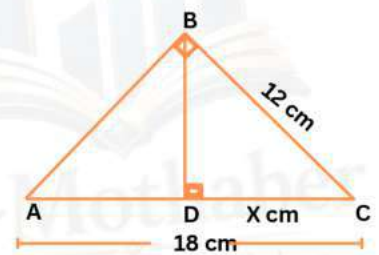


- 4 If b is the mean proportional between a and c , prove that :

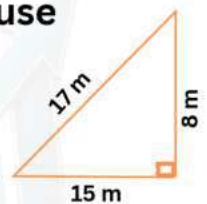
$$\frac{a - c}{a + b} = \frac{a - 2b + c}{a - b}$$

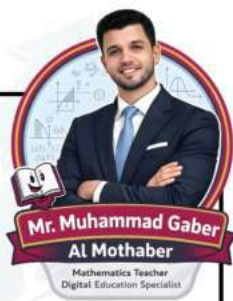
- 5 If R is a relation from X to Y where $X = \{2, 3, 4, 5\}$ and $Y = \{3, 5, 6, 7, 9, 11\}$ and « $X R y$ » means « $y = 2X + 1$ » for every $X \in X, y \in Y$, write R as a set of ordered pairs and represent the relation with an arrow diagram, and state whether the relation represents a function or not.

- 6 In the figure opposite :
Find the value of X ?



- 7 The base of a triangular prism is a right triangle, with a hypotenuse length of 17 meters and one of its sides is of length 8 meters. If the height of the prism is 12 meters, what is its volume ?





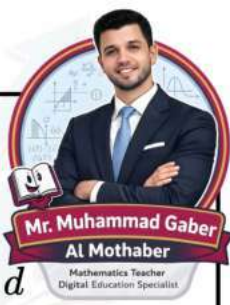
Question 1

Choose the correct answer

- 1 If: $\frac{a}{5} = \frac{b}{3}$ what is the value of $\frac{a+b}{a-b}$
 - (a) $\frac{1}{4}$
 - (b) $\frac{8}{3}$
 - (c) $\frac{5}{3}$
 - (d) 4
- 2 If: $f(X) = 4 - X$ what is the value of: $f(-4)$?
 - (a) 0
 - (b) 4
 - (c) 8
 - (d) -8
- 3 What is the solution set of the inequality: $1 < 2X-3 \leq 5$ in $\mathbb{R}$?
 - (a) $]1, 5]$
 - (b) $]4, 8]$
 - (c) $]2, 4]$
 - (d) $[2, 4[$
- 4 What is the diameter length of a circle with an area of 36π square inches ?
 - (a) 36 inches
 - (b) 12 inches
 - (c) 18 inches
 - (d) 6 inches
- 5 If the distance between the points $B(3, 2)$, $A(X, 0)$ equals $2\sqrt{5}$ units of length, then what is the set of possible values of X ?
 - (a) $\{-1, 7\}$
 - (b) $\{7\}$
 - (c) $\{-4, 4\}$
 - (d) $\{-4, 7\}$
- 6 If: $X = \{2\}$ and $n(Y) = 2$, then: $n(X \times Y) = \text{-----}$
 - (a) 1
 - (b) 2
 - (c) 4
 - (d) 8
- 7 Which of the following numbers are proportional ?
 - (a) 3,5,8
 - (b) 2,6,4
 - (c) 3,9,27
 - (d) 1,4,9
- 8 The sample method is suitable for all of the following except -----
 - (a) check the desert sands.
 - (b) check the factory's production.
 - (c) know the population.
 - (d) patient's blood test.
- 9 If the slope of the line passing through the points $(a, 3)$ and $(2, b)$ equals $\frac{1}{2}$, what is the value of a ?
 - (a) $4 - 2b$
 - (b) $8 - 2b$
 - (c) $2b - 4$
 - (d) $2b - 8$



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Question 2

Answer the following

- 1 If : a, b, c, d are proportional quantities. Prove that : $\frac{a+b}{a-b} = \frac{c+d}{c-d}$

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- 2 Find the area of the base of a right pentagonal prism with a height of 8 cm. and a volume of 168cm^3 .

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- 3 In the given graph :

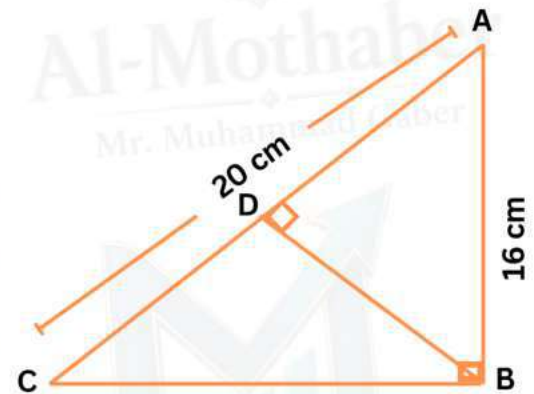
Find : The length of the projection of $\overline{AB}$ on $\overleftrightarrow{AC}$

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- 4 If R is a relation on X where $X = \{1, 2, 3, 4, 5\}$ and " $X R y$ " means " $X + y = 5$ " for each $X \in X, y \in Y$ write the domain and range of the relation and represent it with an arrow diagram.

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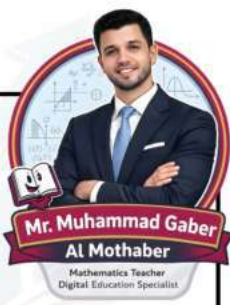
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- 5** The club plays 30 matches in the league, and if the probability of a draw in one of the matches is 0.2 and the probability of winning is 0.5, find :

a The expected number of matches to end in a draw.

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b The expected number of matches to lose.

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- 6** If: $\frac{3a - 4b}{3b - 4c} = \frac{b - a}{c - b}$ Prove that : b is the mean proportional between a , c

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- 7** In the given figure :

$AB > AC$ and $\overrightarrow{BD}$ bisects $\angle ABC$ and $\overrightarrow{CD}$ bisects $\angle ACB$

Prove that : $BD > CD$

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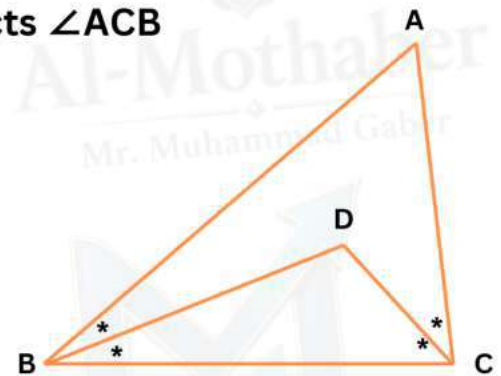
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حمل الآن

مجانا وحصريا

امتحانات رقم (4)

الترم الثاني



MODEL EXAM No (1)

[1] [A] Choose the correct answer:(1) The S.S. of the inequality $-2 < X < 7$ in R is

- a) $[-2, 7]$ b) $[-2, 7[$ c) $] -2, 7]$ d) $] -2, 7[$

(2) The straight line that representing the function $f(x) = 6 - 2x$, cutting Y axis in the point

- a) $(0, 6)$ b) $(0, 3)$ c) $(0, -3)$ d) $(0, -6)$

(3) If $x, 5, 7, 35$ are proportion quantities, then $x = \dots\dots\dots$

- a) 2 b) 3 c) 1 d) 7

[B] Adel has three sons, their ages are 6, 11, and 18 years, for
 How many years ago were the years proportional?

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 □
 □

[2] [A] Choose the correct answer:(1) The slope of straight line passes through $(3, 5)$ and $(3, -2)$ is

- ...
 a) 0 b) 1 c) -1 d) undefined

(2) If $\frac{a}{4} = \frac{b}{3}$ then $\frac{a}{b} = \dots\dots\dots$

- a) $\frac{3}{7}$ b) $\frac{3}{4}$ c) $\frac{4}{3}$ d) $\frac{7}{3}$

(3) The area of a circle whose circumference 28π cm. is Cm^2 .

- a) 36π b) 72π c) 196π d) 112π

[B] If $X = \{-2, -1, 0, 1, 2\}$, $Y = \{0, 1, 2, 4, 5\}$ and $\mathcal{R}$ is relation from X to Y where $a \mathcal{R} b$ means $((y = x^2))$ for each $x \in X, y \in Y$. Write $\mathcal{R}$ and show with reason if $\mathcal{R}$ is a function or not? And if $\mathcal{R}$ is a function, mention its range.

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[Q3] [A] Choose the correct answer:

(1) If $X = \{1, 3\}$, $Y = \{4, 5\}$ then $(5, 1) \in$

- a) $Y \times X$ b) $X \times Y$ c) X^2 d) Y^2

(2) The volume of a right cylinder of radius 7 cm., its height 10cm. is cm^3 .

- a) 154 b) 490π c) 154π d) 440

(3) The distance between two points $(13, 2), (4, 14)$ isunit length

- a) 13 b) 14 c) 15 d) 12

[B] in the opposite figure :

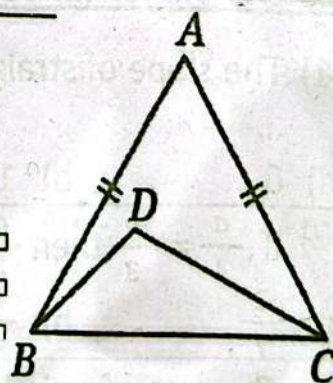
$AB = AC, m(\angle ACD) > m(\angle ABD)$

Prove that $DC > DB$

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[4]

[A] find the volume and the total surface area of the opposite prism

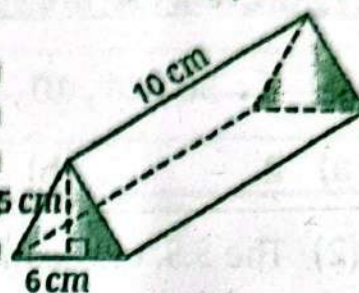
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[B] If $\frac{a}{3} = \frac{b}{4} = \frac{c}{5} = \frac{4a + mb + 5c}{25}$, then find the value of m?

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[5]

[A] Find the real value of X:

$$-7 < 3x + 2 < 14$$

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[B] A random sample of students from a school consisting of 30 male and 20 female students, including students who wear glasses, is taken from this sample. If a person is randomly selected, find the probability that the person is a student who does not wear glasses. If the total number of students in the school is 500, find the expected number of students who wear glasses.

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End of the questions

MODEL EXAM No (2)

[1] [A] Choose the correct answer:(1) If: 30, 24, 10, y are proportional. then then $y = \dots\dots$

- a) 2 b) 5 c) 4 d) 8

(2) The S.S. of the inequality $x - 1 > 6$ in R is

- a) $[5, 7]$ b) $]7, \infty[$ c) $] -7, \infty[$ d) $[7, \infty[$

(3) If $F(x) = x + 5$, $g(x) = 2x$, then $F(2) + 2g(5) = \dots\dots\dots$

- a) 17 b) 72 c) 27 d) 15

[B] If b is a middle proportion between a and c :

$$\frac{2a+3b}{3c+2b} = \frac{a+3b}{b+5c}$$

[2] [A] Choose the correct answer:(1) The area of a circle whose diameter length 10 cm. is Cm^2 .

- a) 10π b) 50π c) 2.5π d) 100π

(2) A school with 500 students, from which a random sample of 30 boys was chosen, and it was found that the number of girls was 15 girls. What is the expected number of boys in the school?

- a) 200 b) 250 c) 300 d) 350

(3) The distance between (6, 9) and (2, 12) equal unit length.

- a) 4 b) 3 c) 5 d) 10

[B] If $X = \{ 0, 1, 2, 4, 5 \}$ and $\mathcal{R}$ is relation on X where $a \mathcal{R} b$ means $((y = x + 1))$ for each $x \in X, y \in Y$.

Write $\mathcal{R}$ as a set of order pairs, represent it by arrow diagram.

[03] [A] Choose the correct answer:

(1) If The slop of the straight line passes through $(4, 2), (a, 3)$ is 1, then $a = \dots$

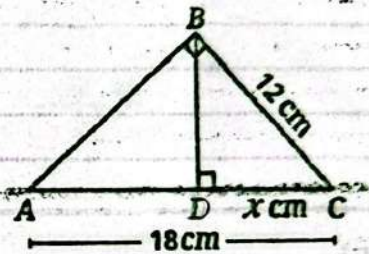
a) 1

b) 3

c) 5

d) 6

(2) The length of the projection of $\overline{AB}$ on $\overline{BC}$ is cm.



a) 8

b) 10

c) 12

d) 18

(3) If the volume of a right cylinder whose radius length equal its height is 125π , then The lateral surface area is

a) 50π

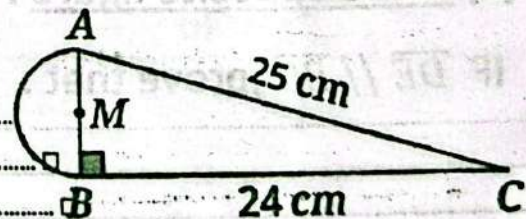
b) 100π

c) 150π

d) 125π

[B] in the opposite figure :

Find the area ? $(\pi = \frac{22}{7})$



MODEL EXAM No (3)

[1] [A] Choose the correct answer:

(1) The fourth proportion for : 8 , 12 , 14 is

- a) $9.\bar{3}$ b) 16 c) 21 d) 110

(2) The S.S. of the equation $6x + 2 = 4x - 4$ in R is

- a) -3 b) $[0, -3]$ c) $]0, -3[$ d) $\{-3\}$

(3) If $X = \{5, 7, 9\}$, $Y = \{9, 10\}$, R is a relation from X to Y where $R = \{(5, 9), (8, 9), (k, 9)\}$ then $k =$

- a) 5 b) 7 c) 8 d) 9

[B] If $\frac{a}{b} = \frac{4}{3}$, find the value of $\frac{3a-2b}{3a+2b}$

[2] [A] Choose the correct answer:

(1) If b is a middle proportion of 3 , 12 then $b =$

- a) ± 4 b) ± 6 c) ± 9 d) ± 36

(2) If $(x+3, xy) = (5, -8)$ then $x+y =$

- a) 2 b) -2 c) 6 d) -6

(3) The circumference of a circle of diameter 32 cm. is π cm.

- a) 16 b) 32π c) 32 d) 1024

[B] If $X = \{-1, 0, 1\}$, $Y = \{0, 1, 2\}$, $Z = \{4\}$ find

① $(X \cap Y) \times Z$

② $(X - Y) \times Z$

[03] [A] Choose the correct answer:

(1) If The slop of the straight line passes through $(-1, 5)$, $(7, k)$ is $\frac{3}{2}$, then $k = \dots$

- a) 3 b) 1 c) 5 d) 7

(2) The distance between $(6, -3)$ and $(-2, 3)$ is Unit length

- a) 5 b) 10 c) 7.5 d) 7

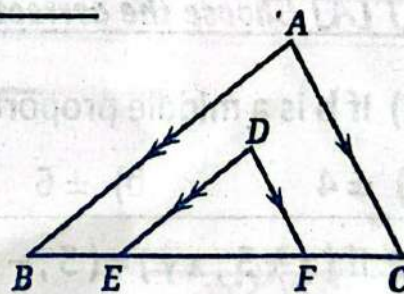
(3) If the volume of a right cylinder whose radius length 4 cm. its height 35cm. is (to nearest tenth)

- a) 1579.3 b) 1779.3 c) 1759.3 d) 1760

[B] In the opposite figure :

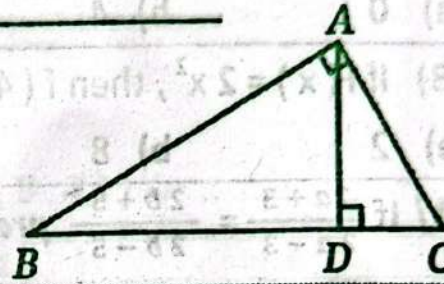
$AB < AC$

Prove that : $DE > DF$



Then find the intersection point of two axes X and Y?

Find the length of : $\overline{AC}$, $\overline{AD}$



[A] A rectangular prism of dimensions 8 cm. , 4 cm. and its total area 280 cm^2 . Find its volume?

[B] A hospital with 40 doctors and 200 nurses 36 individuals are used of layer sample, according to its size. Find the number of nurses in this sample ?

End of the questions

MODEL EXAM No (4)

[1] [A] Choose the correct answer:

(1) The third proportion for : 12 , 28 , 35 is

- a) 7 b) 20 c) 15 d) 29

(2) If $(x+3, y-3) = (5, -5)$ then $x+y = \dots\dots\dots$

- a) 0 b) 4 c) -4 d) undefined

(3) If $F(x) = 2x^2$, then $f(4) - f(2) = \dots\dots\dots$

- a) 2 b) 8 c) 12 d) 24

[B] If $\frac{2a+3}{2a-3} = \frac{2b+5}{2b-5}$ prove that : $\frac{a}{b} = \frac{3}{5}$ $\square$ **[2] [A] Choose the correct answer:**

(1) Which of the following equation of first degree in one variable

- a) Personal interview c) Observing and measuring
b) questionnaires d) Data base of the student in a school

(2) The length of the projection of a line segment on a given straight line the length of the line segment itself.

- a) < b) > c) = d) otherwise

(3) is a secondary resource of collecting data

- a) 36π b) 72π c) 196π d) 112π

[B] If $X = \{-2, -1, 0, 1, 2\}$, $Y = \{0, 1, 2, 4, 5\}$ and $\mathcal{R}$ is relation from X to Y where $a \mathcal{R} b$ means $((y = x^2))$ for each $x \in X, y \in Y$. Write $\mathcal{R}$ and show with reason if $\mathcal{R}$ is a function or not? And if $\mathcal{R}$ is a function, mention its range.

[03] [A] Choose the correct answer:

(1) If $X \times Y = \{(4, 5), (4, 7), (9, 5), (9, 7)\}$ $X = \dots\dots\dots$

- a) $\{5, 9\}$ b) $\{5, 7\}$ c) $\{4, 7\}$ d) $\{4, 9\}$

(2) The volume of a right cylinder of radius 7 cm., its height 10cm. is cm^3 .

- a) 154 b) 490π c) 154π d) 440

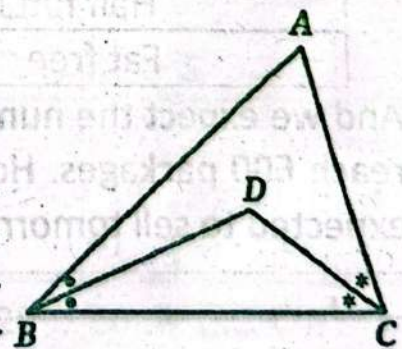
(3) If $A(-3, 0)$, $B(0, 4)$, then $AB = \dots\dots\dots$ unit length

- a) 1 b) 3 c) 5 d) 7

[B] In the opposite figure :

$AB > AC$, $\overrightarrow{BD}$ bisect $\angle ABC$,

$\overrightarrow{CD}$ bisect $\angle ACB$ Prove that: $BD > CD$



[A] If the lateral surface of a right cylinder 110 cm^2 and its radius length equal 10 cm . , Find its volume?

[B] If $\frac{a}{3} = \frac{b}{4} = \frac{c}{5} = \frac{4a + mb + 5c}{25}$, then find the value of m?

[A] Find the real value of X : $-7 < 3x + 2 < 14$

Kind of milk	The number of packages
Full fat	100
Half fat	25
Fat free	75

And we expect the number of packages sold to increase tomorrow to reach 600 packages. How many packages of the fat-free type are we expected to sell tomorrow?

End of the questions

MODEL EXAM NO (5)

[1] [A] Choose the correct answer:

(1) If $(x, y-2) = (3, 3)$ then $x+y = \dots\dots$

- a) -5 b) -6 c) 6 d) 5

(2) The St. line which representing by $F : F(x) = 16 - 4x$. cutting X axis at the point

- a) (0, 16) b) (0, 4) c) (0, -4) d) (0, -16)

(3) If $x, 5, 7, 35$ are proportion quantities, then $x = \dots\dots\dots$

- a) 2 b) 3 c) 1 d) 7

[B] If : $\frac{a}{b} = \frac{4}{3}$ then find the value of : $\frac{3a-2b}{3a+2b}$ ☐

[2] [A] Choose the correct answer:

(1) If The slope of straight line passes through $(3, 5)$ and $(a, -2)$ is undefined, then $a = \dots\dots$

- a) 3 b) 5 c) -2 d) -3

(2) If $\frac{a}{4} = \frac{3}{3}$ then $\frac{a}{b} = \dots\dots\dots$

- a) $\frac{3}{7}$ b) $\frac{1}{3}$ c) $\frac{4}{7}$ d) $\frac{7}{3}$

(3) The area of a circle whose circumference 28π cm. is Cm^2 .

- a) 36π b) 72π c) 196π d) 112π

[B] Find the S.S. of the inequality:

$$2(6 - 2x) \leq 8$$

[Q3] [A] Choose the correct answer:

(1) If $X = \{2, 3, 4, 7, 8\}$, $Y = \{1, 4, 5, 6\}$

Then $n(X^2) - n(Y \times X) = \dots\dots\dots$

- a) 5 b) 10 c) 15 d) 25

(2) The volume of a right cylinder of radius 7 cm., its height 10 cm. is cm^3 .

- a) 154 b) 490π c) 154π d) 440

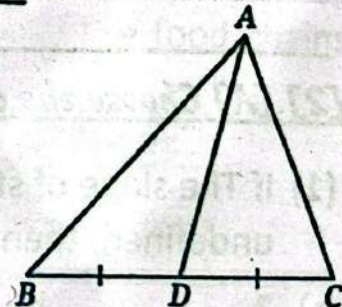
(3) If the distance between two points $(1, 7)$, $(4, k)$ is 5 unit length, then $k = \dots\dots$

- a) 3 b) 11 c) 3 or 11 d) 12

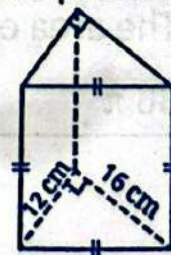
[B] In the opposite figure :

AD is a median, Prove that:

Perimeter of $ABC > 2AD$

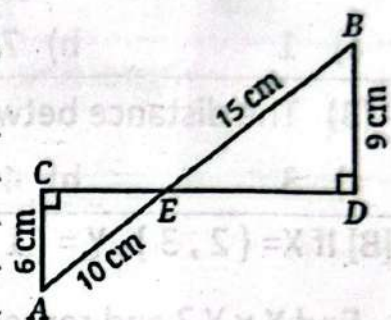


[4] [A] Find volume and total surface area of the opposite prism?



[illegible]

$\angle BDE$ is right , $\angle ACE$ is right Find : BC ?



Activity	Frequency
Football	15
Swimming	8
Hand-ball	4
Volley-ball	3

-
-
-

◆ ◆

End of the questions

MODEL EXAM No (6)

[1] [A] Choose the correct answer:

(1) If $a < b$, then $a + c \dots b + c$

- a) $>$ b) $<$ c) $=$ d) Otherwise

(2) If: $\frac{x}{a} = \frac{y}{6} = \frac{4x-3y}{10}$ then $a = \dots\dots$

- a) 1 b) 7 c) -1 d) -7

(3) The distance between $(-3, 4)$ and origin point is

- a) 3 b) 4 c) 5 d) -5

[B] If $X = \{2, 3\}$, $Y = \{1, 5, 7\}$ find $X \times Y$? and represent it by Cartesian diagram. ☐

[2] [A] Choose the correct answer:

(1) The slope of straight line passes through $(-2, 1)$ and $(-2, 4)$ is ...

- a) 0 b) 1 c) -1 d) undefined

(2) If $\frac{a}{4} = \frac{3}{3}$ then $\frac{a}{b} = \dots\dots$

- a) $\frac{3}{7}$ b) $\frac{1}{3}$ c) $\frac{4}{7}$ d) $\frac{7}{3}$

(3) The circumference of a circle whose radius 13.5 cm..is π cm.

- a) 13.5 b) 72π c) 27π d) 27

[B] find the real value of X: $2x + 9 \leq 6x - 1$

[Q3] [A] Choose the correct answer:

(1) If $X = \{1, 3\}$, $Y = \{4, 5\}$ then $(5, 1) \in \dots\dots\dots$

- a) $Y \times X$ b) $X \times Y$ c) X^2 d) Y^2

(2) The volume of a right cylinder of radius 7 cm., its height 10cm. is cm^3 .

- a) 154 b) 490π c) 154π d) 440

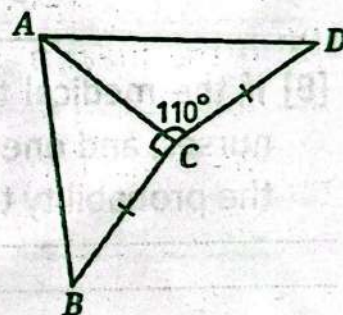
(3) If $A(0, 3)$, $B(-4, 0)$, then $AB = \dots\dots\dots$ unit length

- a) 1 b) 3 c) 5 d) 7

[B] In the opposite figure :

$DC = BC$, $m(\angle ACD) = 110^\circ$

$m(\angle ACB) = 90^\circ$, Prove that $AD > AB$



[4]

[A] A rectangular prism with a square base of side length of 4 cm, and a volume of 192cm^3 . Find its total area ?

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↪ find the value of $\frac{4a+2b+c}{3a+4b-3c}$

[A] Find the real value of X: $5X + 8 < -7$

End of the questions

MODEL EXAM NO (7)

[1] [A] Choose the correct answer:

(1) The S.S. of the inequality $-2 < X < 7$ in R is

- a) $[-2, 7]$ b) $[-2, 7[$ c) $] -2, 7]$ d) $] -2, 7[$

(2) The straight line that representing the function $\mathcal{F}(x) = 6 - 2x$, cutting Y axis in the point

- a) $(0, 6)$ b) $(0, 3)$ c) $(0, -3)$ d) $(0, -6)$

(3) If $x, 5, 7, 35$ are proportion quantities, then $x = \dots\dots\dots$

- a) 2 b) 3 c) 1 d) 7

[B] If: $2a = 3b = 4c$, $a + b + c = 52$, then find a, b, c ? $\square$

[2] [A] Choose the correct answer:

(1) If $a < b$, c is a negative real number then $a \times c \dots\dots b \times c$

- a) $<$ b) $>$ c) $=$ d) otherwise

(2) If $\frac{a}{4} = \frac{3}{b}$ then $\frac{a}{b} = \dots\dots\dots$

- a) $\frac{3}{7}$ b) $\frac{1}{3}$ c) $\frac{4}{7}$ d) $\frac{7}{3}$

(3) If a car wheel has a diameter of 70 cm. then circumference of the wheel is cm.

- a) 70π b) 35π c) 70 d) 35

[B] If $X = \{-1, 0, 1\}$, find X^2 and represent it by arrow diagram ?

..... □

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[03] [A] Choose the correct answer:

(1) If $X = \{1, 3\}$, $Y = \{4, 5\}$ then $(5, 1) \in \dots\dots\dots$

a) $Y \times X$

b) $X \times Y$

c) X^2

d) Y^2

(2) The volume of a right cylinder of diameter length 10 cm., its height 15cm. is cm^3 .

a) 150π

b) 75π

c) 375π

d) 1500π

(3) If The two points $(5, k)$, $(-4, 6)$ lies on same circle of center $(1, 2)$ then $k = \dots\dots\dots$

a) 7

b) -7

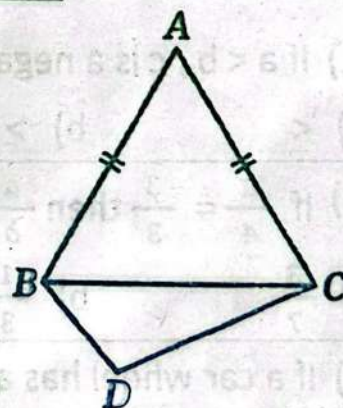
c) -3

d) Both a and c

[B] In the opposite figure :

$AB = AC$, $m(\angle DBC) > m(\angle DCB)$

Prove that: $m(\angle ABD) > m(\angle ACD)$



..... □

..... □

..... □

..... □

□

[A] An alloy in the shape of a triangular prism with a right-angled triangle as its base, lengths of 2 cm and 12 cm, and a height of prism 20 cm, was melted and converted into small cubes of side length (3 cm). Find the number of cubes?

$$\frac{a-c}{a+b} = \frac{a-2b+c}{a-b}$$

[A] find the real value of X: $2 - 3X < -4$

[B] If the penalty shootout rate in a handball match is 60 %, how many goals are expected to be scored when 30 penalty shots are taken?

End of the questions

MODEL EXAM No (8)

[1] [A] Choose the correct answer:(1) If : $x = \{3\}$, then $n(x^2) = \dots$

- a) $\{3\}$ b) 1 c) $\{(3,3)\}$ d) $(3,3)$

(2) If : $\frac{a}{b} = \frac{2}{7}$, then $\frac{2a}{7b} = \dots$

- a) $\frac{4}{49}$ b) 1 c) $\frac{2}{7}$ d) $\frac{49}{4}$

(3) The sampling method is considered the optimal method for all of the following except

- a) Factory production inspection
b) Examining desert sands
c) Knowing the population
d) Patient's blood test

[B] If : 3, a, b, 24 are in continued proportion, then find the value of a, b ?

.....
.....
.....

[2] [A] Choose the correct answer:(1) The slope of straight line passes through $(-2, 5)$ and $(1, 5)$ is ...

- a) 0 b) 1 c) -1 d) undefined

(2) If $\frac{a}{4} = \frac{3}{3}$ then $\frac{a}{b} = \dots$

- a) $\frac{3}{7}$ b) $\frac{1}{3}$ c) $\frac{4}{7}$ d) $\frac{7}{3}$

(3) The area of a circle whose radius 9.2 cm is cm^2 . To nearest tenth

- a) 265.9 b) 256.9 c) 266 d) 270

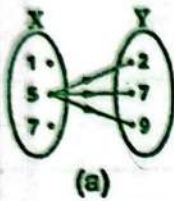
[B] If $X = \{3, 4\}$, $Y = \{4, 5\}$, $Z = \{6, 5\}$, find

① $X \times (Y \cap Z)$

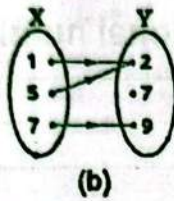
② $(X - Y) \times (Y - Z)$

[03] [A] Choose the correct answer:

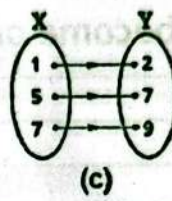
(1) Which of the following relations is not a function from X to Y ?



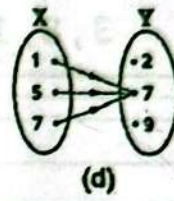
(a)



(b)



(c)



(d)

(2) If the lateral surface of a right cylinder $2\pi r^2 \text{ cm}^2$ then its height is Cm.

a) r

b) r^2

c) 2

d) 1

(3) If $A(0, -3)$, $B(-4, 0)$, then $AB = \dots\dots$ unit length

a) 1

b) 7

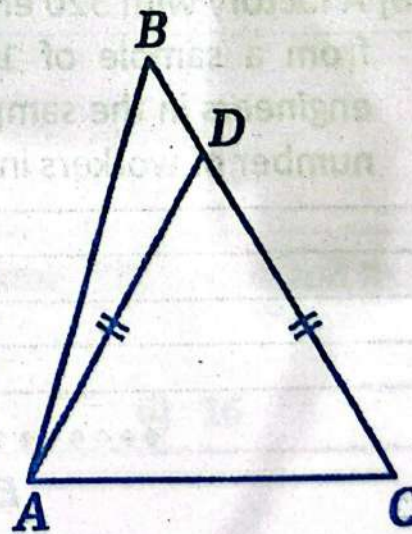
c) 5

d) -7

[B] In the opposite figure :

$AD = DC$, $D \in \overline{BC}$

Prove that $BC > AB$



MODEL EXAM No (9)

[1] [A] Choose the correct answer:

(1) $\{3\} \times \{5\} = \dots\dots$

- a)
- $(3, 5)$
- b)
- $\{3, 5\}$
- c)
- $\{15\}$
- d)
- $\{(3, 5)\}$

(2) The radius of the circle whose area $81\pi \text{ cm}^2$ is cm.

- a) 81 b) 40.5 c) 9 d)
- ± 9

(3) If: $\frac{a}{b} = \frac{c}{d} = \frac{2}{3}$ then $\frac{a+c}{b+d} = \dots\dots$

- a)
- $\frac{4}{3}$
- b)
- $\frac{2}{3}$
- c)
- $\frac{4}{9}$
- d)
- $\frac{1}{3}$

[8] If: a, b, c, d are in continued proportion :

Prove that: $\frac{a^2 + c^2}{b^2 + d^2} = \frac{ac}{bd}$ ☐

[2] [A] Choose the correct answer:(1) The slope of straight line passes through $(-1, 2)$ and $(3, 1)$ is ...

- a) 0 b)
- $\frac{1}{4}$
- c)
- $-\frac{1}{4}$
- d) 4

(2) If $\frac{a}{4} = \frac{3}{3}$ then $\frac{a}{b} = \dots\dots$

- a)
- $\frac{3}{7}$
- b)
- $\frac{1}{3}$
- c)
- $\frac{4}{7}$
- d)
- $\frac{7}{3}$

(3) The (S.A) of a right cylinder whose volume $320\pi \text{ cm}^3$ and its height 20 cm. is Cm^2 .

- a) 2 b) 4 c) 8 d) 16

[B] If $X = \{2, 3, 5, 7\}$, $\mathcal{R}$ is relation on X where $a \mathcal{R} b$ means $((b = a - 2))$ for each $a, b \in X$.

① Write $\mathcal{R}$ and represent it by arrow diagram?

② Is $\mathcal{R}$ is a function or not?

③ If $\mathcal{R}$ is a function, mention its range ?

[03] [A] Choose the correct answer:

(1) If the probability of a football team winning a match is 0.75, how many matches are they expected to win out of a total of 24 matches?

- a) 6 b) 12 c) 18 d) 20

(2) The volume of a right cylinder of radius 7 cm., its height 10cm. is cm^3 .

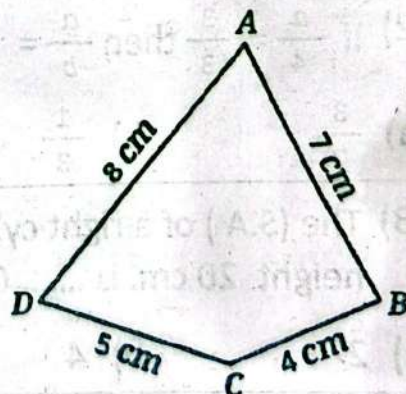
- a) 154 b) 490π c) 154π d) 440

(3) The distance between two points $(2, 1)$, $(-2, 4)$ isunit length

- a) 3 b) 4 c) 5 d) 12

[B] In the opposite figure :

Prove that: $m(\angle ACD) > m(\angle ABD)$



[A] The dimensions of a cuboid are 3 cm. , 4 cm. and 5 cm. Calculate its volume and its total area.

[Faint, illegible markings]

[B] If 3, a, b, 24 are in continued proportion, find the value of each of a, b?

10

[A] Find the real value of X: $11 > 2x + 1 > -5$

[illegible]

[B] A class has 36 students, 27 of them passed mathematics, 12 passed Arabic, and 5 passed both exams. If a student is chosen randomly, find the probability that the chosen student:

- ① Will pass mathematics ② Will pass Arabic
③ Will **NOT** pass mathematics ④ **Fail** in both

[illegible]

End of the questions

MODEL EXAM No (10)

[1] [A] Choose the correct answer:(1) If $X = \{1, 3\}$, $Y = \{4, 5\}$, $(5, a) \in Y \times X$ then $a = \dots$

- a) 1 b) 3 c) 4 d) 5

(2) If: $F(x) = 7$, then $\frac{5f(4)}{10f(6)} = \dots$

- a) $\frac{7}{2}$ b) $\frac{7}{3}$ c) $\frac{1}{2}$ d) $\frac{1}{3}$

(3) If: $5x - 3y = 0$, then $\frac{x}{y} = \dots$

- a) $\frac{5}{3}$ b) $\frac{3}{5}$ c) 1 d) $-\frac{3}{5}$

[B] If b is a middle proportion between a and c Prove that: $\frac{3a+4b}{3b+4c} = \frac{a}{b}$ □**[2] [A] Choose the correct answer:**(1) The slope of straight line passes through $(1, 2)$ and $(4, 5)$ is ...

- a) 0 b) 1 c) -1 d) undefined

(2) If $\frac{a}{4} = \frac{3}{b}$ then $\frac{a}{b} = \dots$

- a) $\frac{3}{7}$ b) $\frac{1}{3}$ c) $\frac{4}{7}$ d) $\frac{7}{3}$

(3) The height of a cuboid is 4 cm. and its base is a square of side length 5 cm then its volume is

Find;

- a) 10 b) 16 c) 25 d) 100

[B] If $X = \{-2, -1, 0, 1, 2\}$ and $\mathcal{R}$ is relation on X where $a \mathcal{R} b$ means $((a + b = 0))$ for each $a, b \in X$,

① Write $\mathcal{R}$ and show with reason if $\mathcal{R}$ is a function or not?

② And if $\mathcal{R}$ is a function, mention its range.

[03] [A] Choose the correct answer:

(1) If $X = \{1, 3\}$, $Y = \{4, 5\}$ then $(5, 1) \in \dots\dots\dots$

- a) $Y \times X$ b) $X \times Y$ c) X^2 d) Y^2

(2) The area of a circle is $25\pi \text{ cm}^2$. then its circumference is ... $\pi \text{ cm}$.

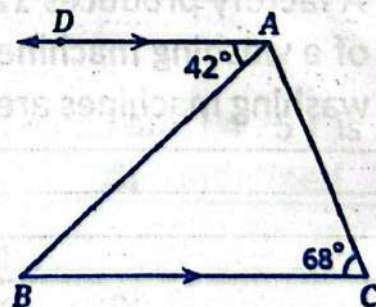
- a) 5 b) 10 c) 25 d) 20

(3) If the distance between two points $(x, 0)$, $(3, 2)$ is $2\sqrt{5}$ unit length., then the values of possible x is

- a) $\{-1, 7\}$ b) $\{7\}$ c) $\{-4, 4\}$ d) $\{-4, 7\}$

[B] In the opposite figure:

$\overline{AD} \parallel \overline{BC}$, Prove that: $BC > AC$



[4] T. S. Bieganski and G. G. Brown, *IEEE Trans. Automat. Contr.*, vol. 38, no. 12, pp. 1523–1528, Dec. 1993.

1. The first line of the document is a header containing the name of the institution, the name of the course, and the name of the student.

2. The second line of the document is a header containing the name of the institution, the name of the course, and the name of the student.

3. The third line of the document is a header containing the name of the institution, the name of the course, and the name of the student.

$$\frac{a-b}{a-2b+c} = \frac{a+b+c}{a-d}$$

[A] Find the real value of X: $-3 < 2x + 5 < 13$

[A] Find the real value of X: $-3 < 2x + 5 < 13$

1. The first part of the document is a list of names and dates, which appears to be a roster or a list of participants. The names are written in a cursive script, and the dates are written in a more formal, printed style. The list is organized into columns, with names in the first column and dates in the second column.

2. The second part of the document is a series of handwritten notes or a letter. The text is written in a cursive script and is somewhat difficult to read due to the handwriting. It appears to be a personal communication, possibly a letter or a note, and it contains several lines of text.

3. The third part of the document is a series of printed lines, which appear to be a form or a template. The lines are arranged in a grid-like pattern, with some lines being longer than others. This part of the document is likely a form used for recording information, such as a ledger or a record book.

End of the questions

MODEL EXAM NO (11)

[1] [A] Choose the correct answer:(1) If $X^2 = \{(4, 9), (a, a), (b, a), (b, b)\}$, then $X = \dots$

- a) $\{2, 3\}$ b) $\{4, 9\}$ c) $\{4\}$ d) $\{9\}$

(2) If: $F(x) = ax$, $F(1) = 2$, then $a = \dots$

- a) $\frac{1}{2}$ b) 2 c) 3 d) $\frac{1}{3}$

(3) If: $5x - 7y = 0$, then $\frac{x}{y} = \dots$

- a) $\frac{5}{7}$ b) $\frac{7}{5}$ c) 1 d) $-\frac{7}{5}$

[6] If a, b, c, d are proportional then prove that :

$$\frac{a+b}{b} = \frac{c+d}{d}$$

[2] [A] Choose the correct answer:(1) The slope of straight line passes through $(4, 2)$ and $(4, 5)$ is ...

- a) 0 b) 1 c) -1 d) undefined

(2) If $\frac{a}{b} = \frac{b}{4}$, $a - b = -1$, then $a \times b = \dots$

- a) 1 b) 2 c) 4 d) 8

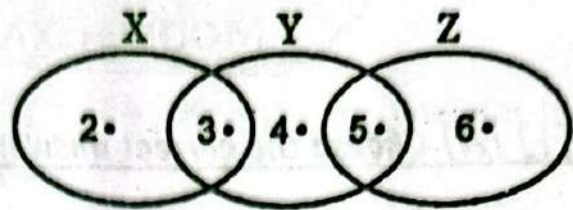
(3) The height of a cuboid is 4 cm. and its base is a square of side length 5 cm then its volume is

- a) 10 b) 16 c) 25 d) 100

[B] In the opposite Venn diagram:

① $X \times (Y \cap Z)$

② $(X \cup Y) \times (Y - Z)$



[03] [A] Choose the correct answer:

(1) If $X = \{1, 3, 5\}$, $n(X \times Y) = 12$, then $n(Y^2) = \dots\dots\dots$

- a) 4 b) 6 c) 9 d) 16

(2) The area of a circle whose diameter 6 cm. is $\dots \pi \text{ cm}^2$.

- a) 3 b) 6 c) 9 d) 12

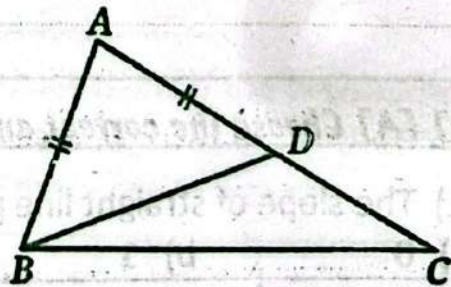
(3) If the distance between two points $(x, 2)$, $(3, 2)$ is 8 unit length., then the values of possible x is

- a) $\{-11, 5\}$ b) $\{5\}$ c) $\{-5, 11\}$ d) $\{-11, 8\}$

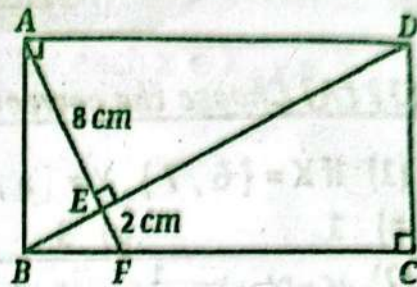
[B] In the opposite figure :

$AB = AD, C \in \overline{AD}$

Prove that: $m(\angle ABD) > m(\angle C)$



Find : length of $\overline{BD}$



$F(x) = x + 5$ and graph it?

[A] Find the real value of X: $2x - 19 \leq 3x - 18 < x - 8$

[B] If the medical team in a hospital consists of 12 doctors and 60 nurses, and one member of the team is chosen randomly, what is the probability that he will be a nurse?

End of the questions

MODEL EXAM NO (12)

[1] [A] Choose the correct answer:(1) If $X = \{6, 7\}$, $Y = \{a, 5\}$, $(6, 3) \in X \times Y$, then $a = \dots$

- a) 1 b) 3 c) 4 d) 5

(2) If: $F(x) = \frac{1}{3}x$, then $3f(6) = \dots$

- a)
- $\frac{1}{18}$
- b)
- $\frac{1}{6}$
- c) 18 d) 6

(3) If: $3x - 5y = 0$, then $\frac{x}{y} = \dots$

- a)
- $\frac{5}{3}$
- b)
- $\frac{3}{5}$
- c) 1 d)
- $-\frac{3}{5}$

[B] If a, b, c, d are proportional then prove that:

$$\frac{a+b}{a-b} = \frac{c+d}{c-d}$$

..... □

..... □

..... □

□

[2] [A] Choose the correct answer:(1) The slope of straight line passes through $(1, 2)$ and $(4, 5)$ is ...

- a) 0 b) 1 c) -1 d) undefined

(2) If $\frac{a}{b} = \frac{b}{c} = \frac{4}{5}$, $a + b + c = 122$, then $a = \dots$

- a) 4 b) 32 c) 40 d) 50

(3) The height of a cuboid is 4 cm. and its base is a square of side length 5 cm then its volume is

- a) 10 b) 16 c) 25 d) 100

[B] If $X = \{2, 3, 4\}$ and $Y = \{2, 4, 8, 12, 16\}$ and $\mathcal{R}$ is relation from X to Y where $x \mathcal{R} y$ means $((y = 2^x))$ for each $x \in X, y \in Y$

- ① Write $\mathcal{R}$ as a set of order pairs,
- ② represent it by arrow diagram.
- ③ If $\mathcal{R}$ is a function, mention its range.

[03] [A] Choose the correct answer:

(1) If $X = \{1, 3\}, Y = \{4, 5\}$ then $(5, 1) \in \dots\dots\dots$

- a) $Y \times X$ b) $X \times Y$ c) X^2 d) Y^2

(2) The circumference of a circle whose diameter 6 cm. is ... π cm.

- a) 3 b) 6 c) 9 d) 12

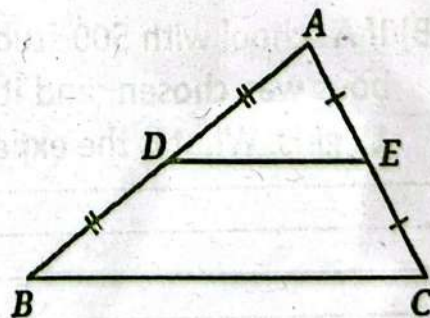
(3) If the distance between two points $(x, 0), (3, 2)$ is $2\sqrt{5}$ unit length., then the values of possible x is

- a) $\{-1, 7\}$ b) $\{7\}$ c) $\{-4, 4\}$ d) $\{-4, 7\}$

[B] In the opposite figure :

$AD > AE$,

Prove that: $m(\angle C) > m(\angle B)$



كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



خطوة 1



خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6